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MAN
THE WORLD
OVER

Frontispiece.

A Japanese Fishing Village.

MAN
THE WORLD
OVER

By C. C. Carter
and H. C. Brentnall

With Drawings by SILVIA HAY *and*
MARION RIVERS-MOORE
Maps by R. H. SHERBOURN

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INTRODUCTION

We hear a great deal in these days of the shrinkage of the world. It is surely prudent for those who must live at such close quarters to know something of neighbours whose gardens and party-walls so ineffectually insulate their activities and their loud-speakers. But where is that knowledge to be obtained? For the shrinking world is not growing appreciably smaller in any physical sense, and there are many countries in it. It is the part of Geography to enlighten us. But the Geography of our youth was too often a repulsive subject—a learning by heart of " capes and bays," statistics of imports and exports, or lists of towns compiled, apparently, with the idea of offending nobody by leaving any out. It abounded also in other kinds of information; but does it seriously matter to most of us that "Jostedalsbræ, a glacier with an area of 400 square miles, lies west of Galdhoppiggen," or even (though the implications are certainly dramatic) that " Leon, the old capital, is surrounded by five volcanoes, and is partly in ruins " ?

We quote from the text-book of a rather distant day. Geography has reformed herself in ways which few parents (and not too many schoolmasters) appreciate. But the average treatise on the subject is still a formidable production. What is wanted is a few simple facts about the world which will enable us to understand, at least in outline, other nations' problems and points of view. These we offer in the following pages, in a form which, we hope, will not be found uninteresting. We might have called our book, after the modern manner, " Geography for the Georgian," but we have resisted that temptation.

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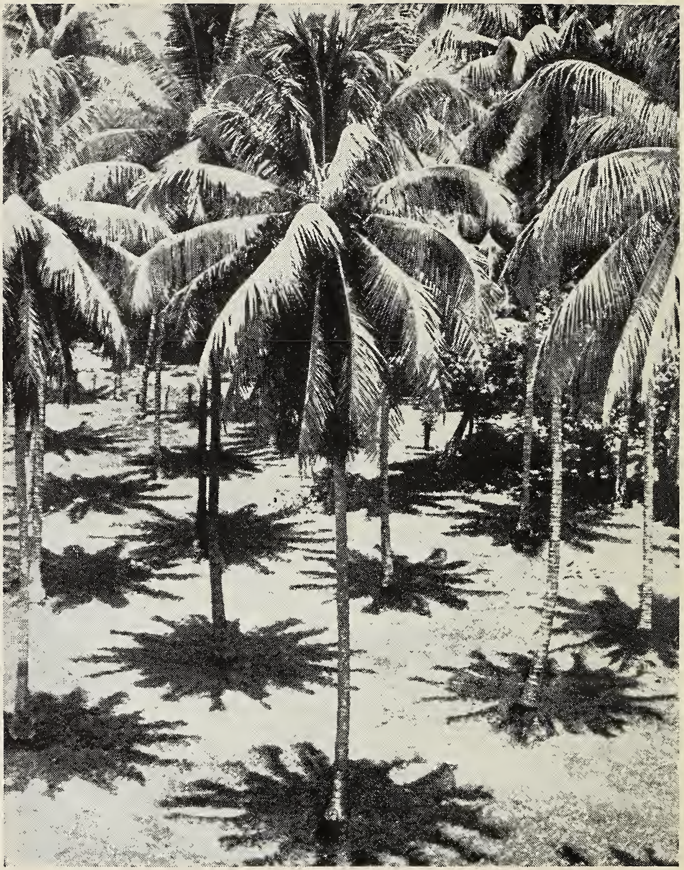
In the maps the symbols for towns denote:

■ (black square) over a million inhabitants.
□ (open square) over half a million inhabitants.
⊙ (ringed dot) over 100,000 inhabitants.
• (dot only) under 100,000 inhabitants.

MAN THE WORLD OVER

PART I



Noon in the Tropics: Palm Trees standing on their Shadows.

MAN THE WORLD OVER

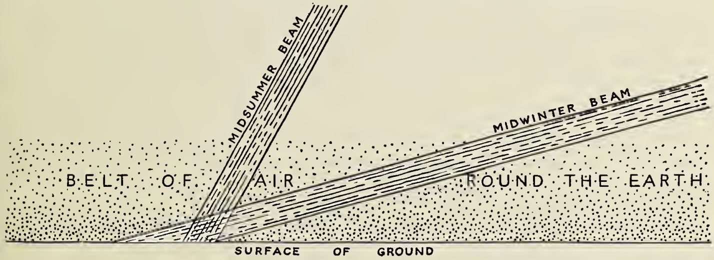
CHAPTER 1

SUN, WIND AND RAIN

MAN, the world over, lives at the mercy of three things—the sun, the wind and the rain. Without them he could not exist, and too much of any of them makes life difficult and at times impossible. Of these the sun is the greatest and is the cause of wind and rain and life itself in all its forms.

In this country we can never stand on the shadows of our own hat-brims, as the palm trees are doing in the picture, because the sun is never directly overhead, but we come much nearer to doing so in June than in December. If we watch our shadows month by month, we can easily discover that this is so. But we must remember to compare one *mid-day* shadow with another, for it is at noon that the sun climbs highest in the sky.

When the sun is high, its heating power is greater. The figure shows the greatest difference in the slant of the sun's rays in England. Each beam of sunlight at mid-day has to warm more than three times as much flat ground in mid-



A January Scene in Southern England.

winter as at mid-summer. But the air stops much of the sun's heat on its way to the earth, and there is a further serious loss in winter from this cause. That is why our summers are so much warmer than our winters.

If we sailed south, however, the sun would rise higher in the sky as we approached the tropics. Near the equator we should find the weather always hot (at least at sea-level), and summer and winter would have no meaning. Beyond the equator, if we travelled further south, seasons like our own would meet us again, but Christmas would come at midsummer and June would be a winter month; for the southern hemisphere is turned furthest away from the sun when the northern is most directly under it. (Look at the figure on p. 87).

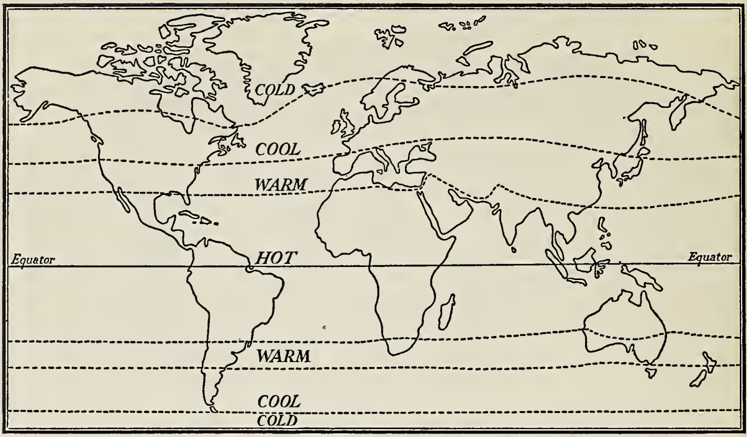
Since the heat we receive from the sun grows less from the equator to the poles, we can divide the world into strips or belts

A January Scene in Australia. While Christmas Day falls in midwinter in Britain, in Australia it comes in midsummer. This is a bathing beach near Sydney, where the south-east trade winds drive the shallow water in long lines of surf on to the sandy beaches. Here the Australians enjoy "surf-bathing," that is, lying flat on the boards seen in the picture and being carried rapidly to the shore on the crest of a breaker.

of temperature: two *Hot* Belts, which join at the equator to make one wide one; two *Warm* Belts; two *Cool* ones; and two Belts of *Cold* round the poles.

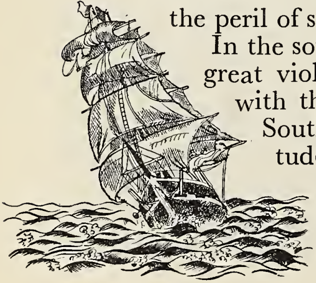
Next in importance to the temperature belts come the great winds. They blow from the Warm Belts, two towards the equator and two towards the poles; but not directly north and south, for the spin of the earth gives each wind a twist. Across the Hot Belt the north-east and south-east trade winds blow towards the equator. They are strong breezes that send the "white horses" racing under the deep blue tropic skies and swell the sails of the Australian grain-ships running home before them.

The other two great winds are the westerlies, which range across the Cool Belts. In the northern hemisphere they blow



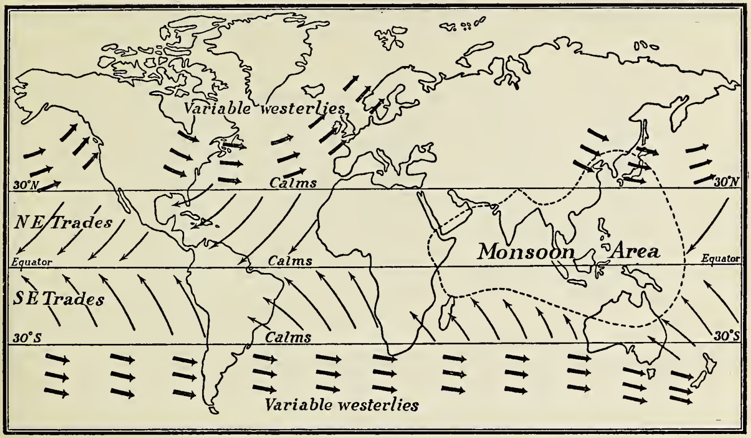
Temperature Belts.

generally from the south of west, bringing to our shores in winter the warmth of sunnier skies than ours and in summertime the coolness of the wide Atlantic. But at times they vary in strength and direction, and often they give place to other winds for weeks together. They may be the lightest of breezes or blow great guns on our western coasts to the peril of ships and crews exposed to them.



In the southern hemisphere the westerlies blow with great violence; for there is little land to interfere with their easterly passage round and round the Southern Ocean. They have given to the latitudes in which they are strongest the names of the "Roaring Forties" and the "Furious Fifties."

The Warm Belts are occupied by both


Variable westerlies
30°N
Calms
30°N
NE Trades
Equator
Calms
Monsoon Area
Equator
SE Trades
30°S
Calms
30°S
Variable westerlies

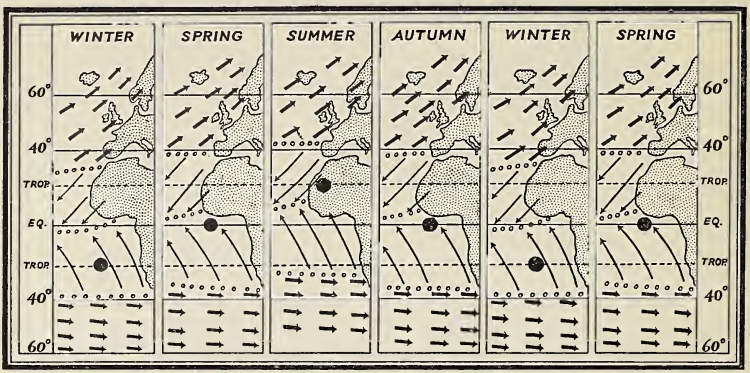
Wind-Systems.

the trade winds and the westerlies, but at different seasons of the year. All the four great winds shift their positions slightly, passing further north in our summer and further south in our winter. The changes are important in their effect upon the weather of the Warm Belts, as we shall see later. They are due to the apparent movement of the sun from south to north of the equator and back again each year. Over and near continents, also, the regular winds of the open oceans are liable to checks and changes.

On winds and temperature depends what is more important to mankind than either, and that is rain.

Water when it is heated turns to vapour and remains in that state till it is chilled again. Air, when it is heated, rises until it loses its heat in the upper atmosphere. Water-vapour combines readily with warm air and, rising with it, is chilled and turned again to water. These changes are the cause of rainfall.

Two things then are necessary to produce rain: moist air and



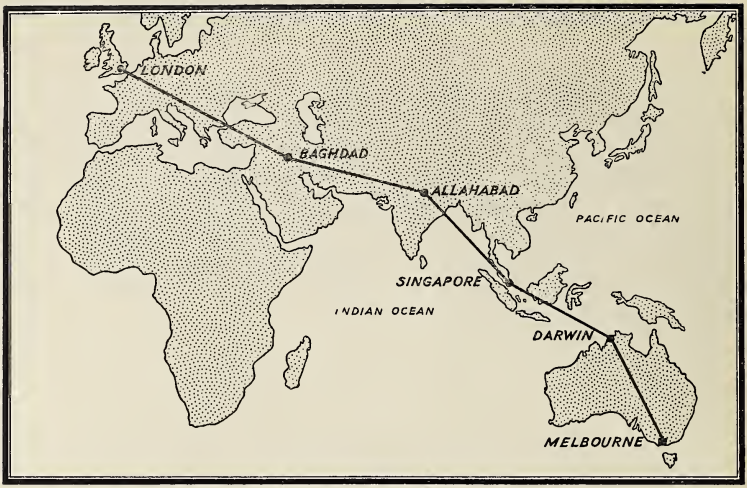
Movement of the Wind-Systems. The seasons named refer to the northern hemisphere. The large black dot represents the latitude where the sun at noon is directly overhead. The long thin arrows represent the steady trade winds; the short thick arrows represent the irregular westerlies. The lines of small circles separate the various wind-belts. The six maps for successive seasons show how the winds of the Atlantic shift northwards and southwards with the sun in the course of the year.

a rising current. The moist air may rise from a heated surface, as from some steaming swamp at the equator; or it may be thrust by the wind against a mountain slope and so forced to rise above it. In either case the result is the same: the water-vapour will be cooled in the upper layers of the atmosphere and fall as rain upon the land below.

At the hot equator, rain in torrents may be expected most afternoons. In the trade wind belts, where the winds are from the east, rain is heaviest on east coasts, where it first comes ashore, and gets less as one goes westward. In the regions of the westerlies it is naturally just the other way about: west coasts are wetter than districts east of them.

If rain were just an unpleasant experience, it would scarcely be worth explaining. But though it may spoil our pleasures, we must remember that we could not live without it. We depend upon it for our water-supply and for everything that grows.

A tree needs a great deal of rain, and forests, therefore, grow only where the rainfall is heavy and fairly steady for most of the year. Where the rain is lighter, or falls only in summer to be dried off quickly by the sun, we may expect to find little but scattered trees and grass-lands (but grain crops, we should remember, are cultivated grasses). Where there is little or no rainfall, the land is desert. We shall meet these different conditions in various parts of the world, and each of them is found in some part of Australia.


LONDON
BAGHDAD
ALLAHABAD
PACIFIC OCEAN
SINGAPORE
INDIAN OCEAN
DARWIN
MELBOURNE

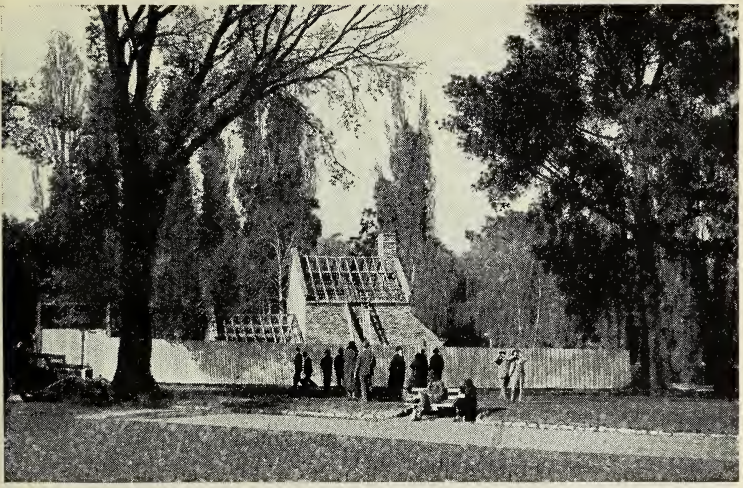
The route of the London—Melbourne air-race, 1934.

Kangaroo with Young.

CHAPTER 2

AUSTRALIA IN EARLY DAYS

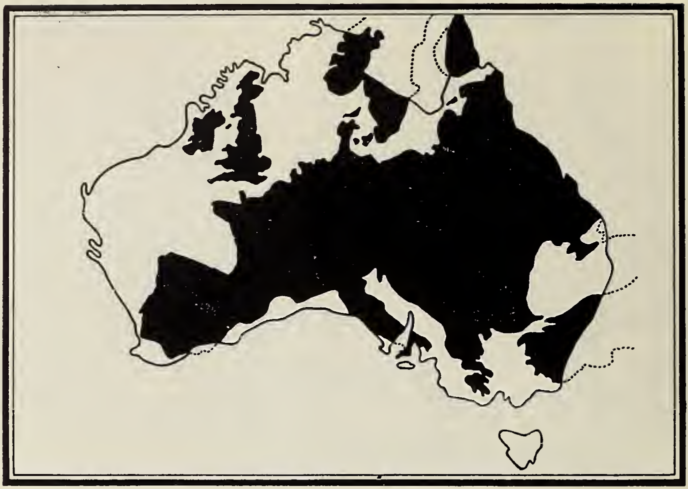
"DOWN under," you will hear people say, when they are talking about Australia or New Zealand. The words remind us that to get to those countries we must go right across the equator and " down " on the other side of the world. To reach Sydney we must travel about 12,000 miles, whichever way we go. But the sea-routes take five weeks, and the air-route can be covered in under a week.



Captain Cook's Cottage at Great Ayton in Yorkshire was bought by the Government of Victoria and re-erected in Melbourne. In return, Victoria is placing at Great Ayton a stone cut from the first Australian point the explorer sighted.

Australia (which means "Southland") is nearly as large as Europe, but it has not quite seven million inhabitants, which is less than the population of London. It is true that much of the interior is not fit for settlers, but there are still wide spaces that might be occupied, if the right sort of settlers could be found to fill them.

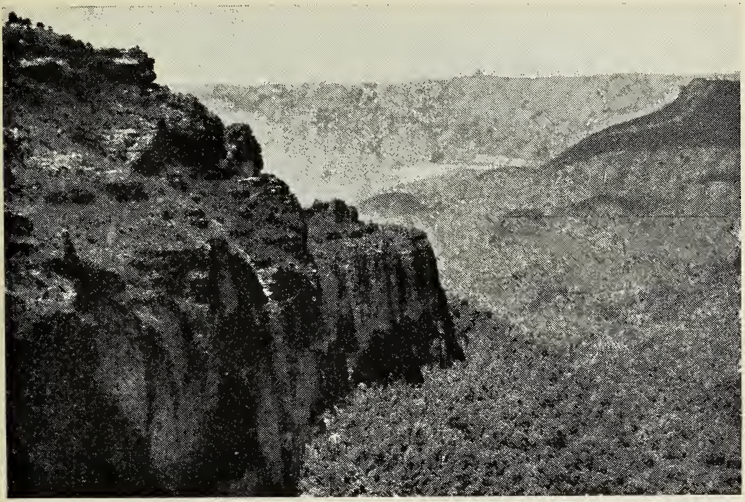
The Dutch were the first Europeans to land in Australia, which they called New Holland. They also named New Zealand after a district in their own country. But they never settled in either, and never visited the eastern shores of Australia at all. The history of modern Australia begins with the voyage of



Size of Australia compared with Europe, showing that, in the south, Australia would reach from Spain to Turkey, and in the north from Ireland to Leningrad in Russia, covering much sea as well.

James Cook. He sailed by the Cape Horn route and so came first to New Zealand. Next year his course brought him to the east coast of "New Holland," and in April, 1770, he landed near the site of Sydney. Three months later he had rounded Cape York and taken possession of the east coast by the name of New South Wales, a name which is now used only for the middle part of it.

The first settlers, however, did not arrive for nearly twenty years. They were actually a batch of prisoners under guard, the kind of men that the English Government had for long been transporting to America. A settlement was formed on Sydney Cove, which was one day to become the leading city of Australia. For colonists soon began to arrive of their own free will, and the



The Blue Mountains were in early days a " barrier of dense wooded ravines and sheer precipices " to the settlers at Sydney. A trail across them was not found until 1813.

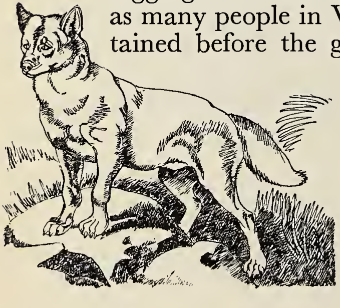
population increased steadily. The settlers suffered, however, from an unusual hindrance. On the edge of a continent more than 2,000 miles in breadth, they found themselves confined to a strip barely 50 miles wide by a barrier of densely wooded ravines and the sheer precipices of the Blue Mountains which lay behind. At last a route was found through this difficult country, and those who followed it were richly rewarded. Beyond the mountains they found wide plains of excellent grass-land, and it was not long before these new pastures began to be filled with the flocks of the pioneers.

The need for further exploration grew urgent. The rivers of this new district all flowed westward and disappeared into the wilds of the interior. No man knew where, if ever, they reached the sea, for the ships that skirted the Australian coasts found no great river mouths. The explorer Sturt resolved to settle the question if he could. He brought the timbers of a boat up from Sydney and put them together on the banks of the Murrumbidgee River. Then he and his party embarked and sailed downstream till they entered the larger Murray River. This brought them, after many adventures, to a broad lagoon. From this its waters passed over a shallow bar into the open sea. The mystery was solved.

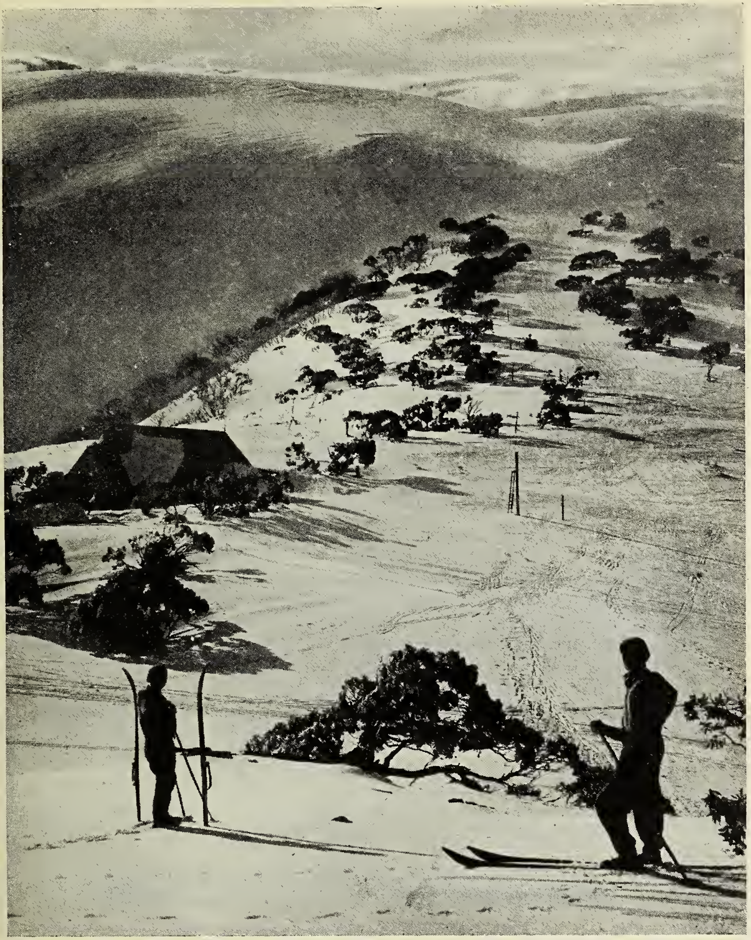
Glowing reports of the new discoveries brought fresh settlers from England to found Adelaide. Others made their way overland from Sydney to the fertile region which is now the State of Victoria. Far away in the south-west Scotsmen were struggling to establish a colony on the site of the present city of Perth.

The settlers in the eastern interior were mainly "squatters," who paid small rents for large tracts of the open grasslands. There the winters are warm, and sheep require no shelter. No wild beasts were to be feared except the dingoes, or wild dogs, though these killed plenty of the sheep at first. The blacks, driven from their hunting-grounds by the white men, only retreated further into the interior. The squatters made their fortunes from wool-growing, the earliest and greatest of Australian industries.

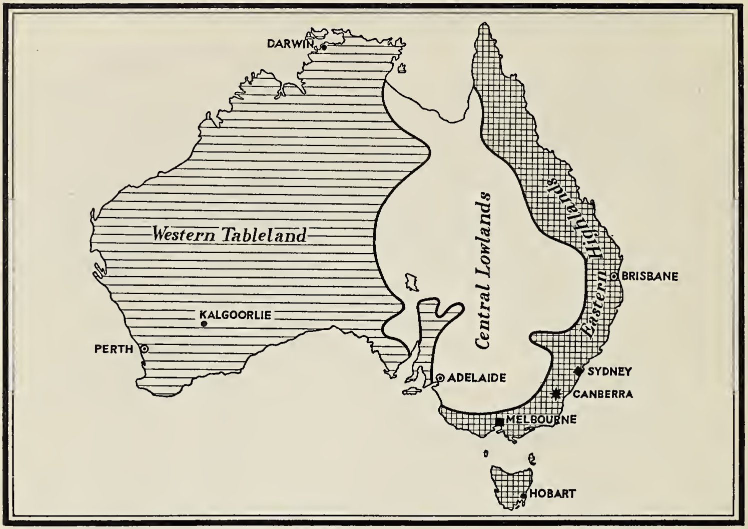
But sheep-stations do not employ many hands. It was the discovery of gold in 1851 that brought men in greater numbers to Australia. They flocked from every quarter of the globe to the diggings in the mountains behind Melbourne. Soon there were as many people in Victoria alone as the whole country had contained before the gold-rush began. Many drifted away again when gold was no longer easy to find, but many stayed to take up other employments.



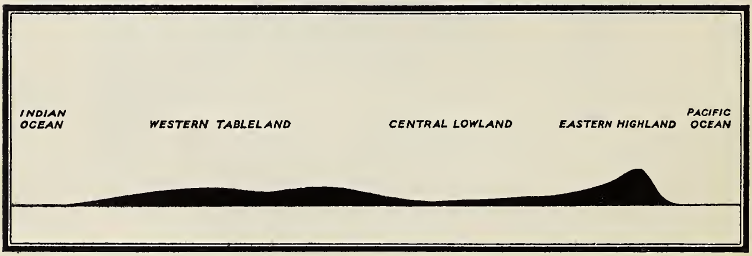
DINGO.



The Australian Alps. In this, the only region where snow lies in winter, skiing and tobogganning are possible. The summit is not jagged like the Alps, but smooth and rounded, as the picture shows; the valleys, however, are deep and steep-sided, as seen on the left. Wind-swept hill-tops are unsuitable for trees; those in the picture are few and stunted.


DARWIN
Western Tableland
Central Lowlands
Eastern Highlands
BRISBANE
KALGOORLIE
PERTH
ADELAIDE
SYDNEY
CANBERRA
MELBOURNE
HOBART

Divisions of the Surface of Australia. Compare this diagram with the map in the atlas and with the section below, noting the three great divisions: (*a*) the Eastern Highlands from Cape York to Tasmania, (*b*) the Central Lowlands from the Gulf of Carpentaria to near Adelaide, (*c*) the low Western Tableland which covers half the continent.


INDIAN OCEAN
WESTERN TABLELAND
CENTRAL LOWLAND
EASTERN HIGHLAND
PACIFIC OCEAN

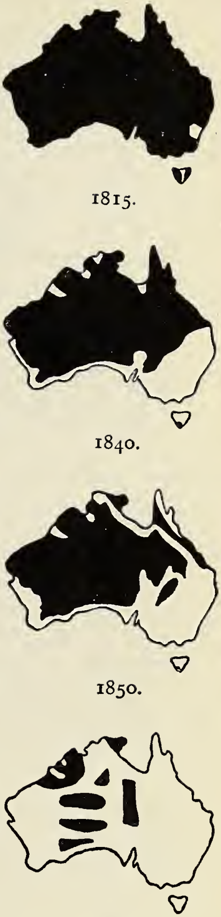
Section from West to East across Australia. The height of the land is greatly exaggerated.

Other gold-fields and rich veins of silver, copper, lead and tin have been found. The resources of Australia were revealed by courageous explorers, some of whom perished in the deserts of the interior. Their reports gave us our first real knowledge about the continent. All the great rivers run, when they run at all, inland from the north and east. Some lose themselves in the salty mudflats of Lake Eyre; some join forces with the Murray and so find at last the southern sea. The East Australian Highlands, in which they rise, slope gently to the west, but break steeply down to the narrow lowlands of the east coast. The Australian Alps, their southern and highest part and the furthest from the equator, gather snow in winter which helps to keep the Murray flowing when its tributaries fail.

Westward beyond the depression which runs from the Gulf of Carpentaria to Adelaide begin the dry uplands of the western half. Here lies the " never, never " country, where no explorer has ever found an attractive home for settlers. The choice, except in the coastal regions, lies between poor grazing country at the best and sheer desert. Only in the south-west is the rainfall reliable enough to support a large population.

The northern coastal areas are unsuitable for extensive settlement, since their climate, except in patches, is unfavourable to white men. For half the year they get too much rain, for the other half too little, and they are always hot.

Tasmania, on the other hand, an island rather smaller than Scotland and with a climate somewhat



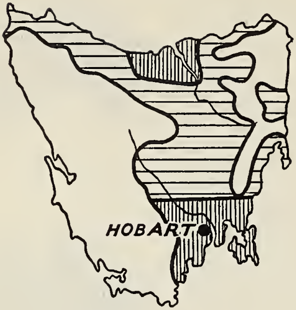
1815.

1840.

1850.

1875.

UNKNOWN AUSTRALIA REVEALED.



similar, thanks to the prevailing westerlies, is more like the "Home Country" than any other part of Australia. It is a mountainous island. The western half is mostly untouched "bush," except for a few mining centres. In the eastern half small farms with orchards of apples and gardens of soft fruits dot the lower slopes of the river valleys and coastal inlets. Hobart, the capital and chief port, lies on a fine harbour in the south-east. In the map above, the ruled lines mark the chief areas of settlement. The close upright lines show the chief fruit-growing districts.

CHAPTER 3

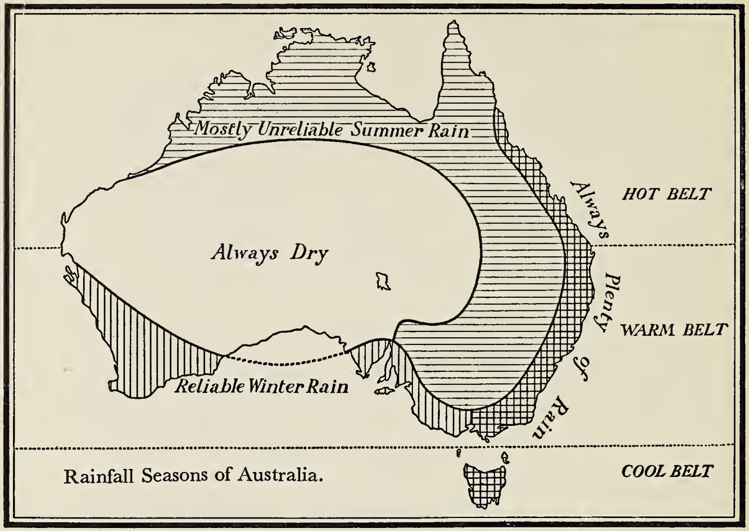
AUSTRALIA: CLIMATE, LIVESTOCK AND CROPS

WE are not often grateful for our rain in England: it is too familiar a blessing. But in many parts of Australia its coming is by no means regular and certain. There are districts where for years together there may be no rain at all. If such a shortage is made up, as it sometimes is, in a single week, and another drought begins, the people who live there are scarcely any better off. Rain, if it is to be useful, must come at regular seasons.

The conditions in Northern Australia we have already mentioned. The rest of the continent is influenced by one or other of two sets of winds, the south-east trades or the westerlies. The south-east trade winds draw moisture from the Pacific Ocean, but as they climb the Eastern Highlands the moisture cools and turns to rain. Storm-clouds gather about the summits, and rain falls in every month of the year, feeding the short, swift rivers that run to the east coast, and covering the eastern slopes with forests, which the Australians call "bush."

But the clouds that get across the mountains have less rain to give to the western slopes, and it does not extend far. The forest thins out, and, though there is plenty of grass at first, that too fails as you get further inland. Beyond the Darling only a few sheep-stations can face the increasing drought; "scrub" country, with dwarfed and scattered shrub-growth, succeeds the grass-land; we are approaching the desert and the "dead heart" of Australia.

Further south, however, both east and west of the Great Australian Bight, the westerlies begin to play their part. These winds, which bring ample rains to Tasmania, are drawn slightly northwards in winter and water the continent from Perth to

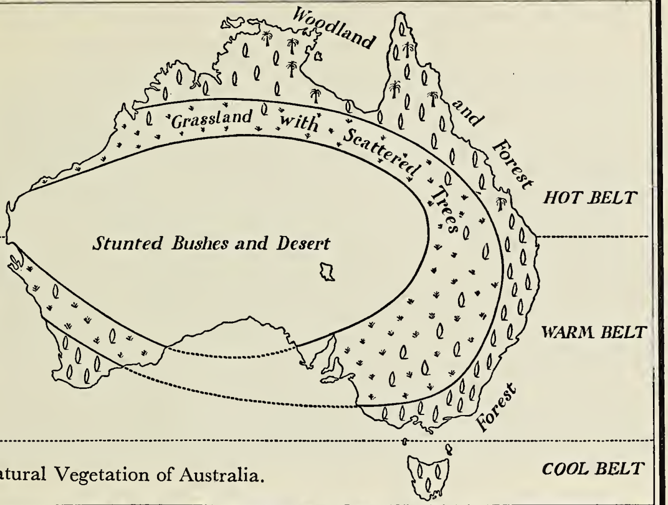

Mostly Unreliable Summer Rain
Always Dry
Always Plenty of Rain
Reliable Winter Rain
HOT BELT
WARM BELT
COOL BELT
Rainfall Seasons of Australia.

Rainfall Seasons of Australia. Notice that (*a*) most of the east coast and Tasmania has plenty of rain in all seasons; (*b*) the eastern interior and the north has rain mostly in summer (November to April); (*c*) the greater part of the interior has little rain at any time; (*d*) the south-west has reliable winter rain (April to October), but the summer is dry.

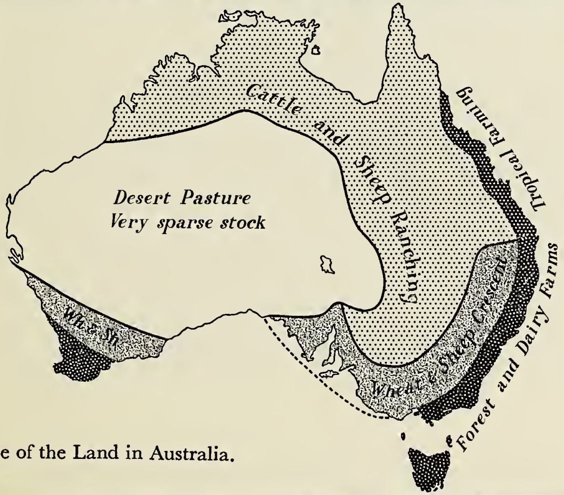
Natural Vegetation of Australia. Compare closely with the rainfall map. Notice that (*a*) where there is always plenty of rain, there is forest, except where cleared by man; (*b*) inside the semi-circle of forest the grass-land with scattered trees corresponds to summer rain; (*c*) the interior of stunted bushes (scrub) and desert is the region where little rain falls.

Use of the Land in Australia. Compare closely with the maps of rainfall and vegetation: (*a*) the rainy forested region has been cleared in parts for dairying and (in Queensland) for tropical crops like sugar-cane, pineapples, and bananas; (*b*) the open grass-lands are the regions for sheep and cattle stations and wheat farms; (*c*) the scrub and desert can feed very few animals.

Melbourne. So they help to secure for South-West and South-East Australia the regular rainfall which attracted the earliest settlers to those parts.


Woodland
and
Forest
Grassland with Scattered Trees
Stunted Bushes and Desert
Forest
HOT BELT
WARM BELT
COOL BELT

Natural Vegetation of Australia.

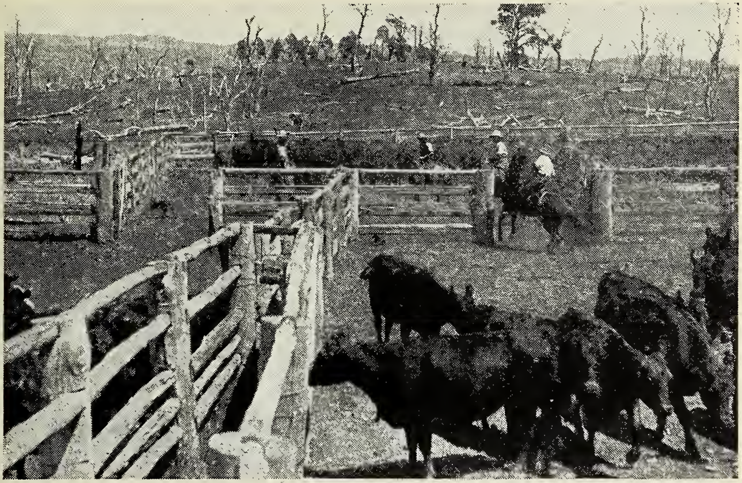

Cattle and Sheep Ranching
Tropical Farming
Desert Pasture
Very sparse stock
Wheat & Sheep
Wheat & Sheep Crescent
Forest and Dairy Farms

Use of the Land in Australia.

Dairy Cattle in Australia. Dairy cows require rich pasture, if they are to produce the best milk in quantity. Here they are feeding quietly in meadows along some river-bottom where the grass is longer and juicier than on the slopes above.

Pioneers in new countries rarely have much money; if they had, they would probably have stayed at home. They look, therefore, not only for suitable climates, but for occupations that will bring them a living for a small outlay. Sheep and cattle offer the best prospects, and next to them come crops that they can sell.

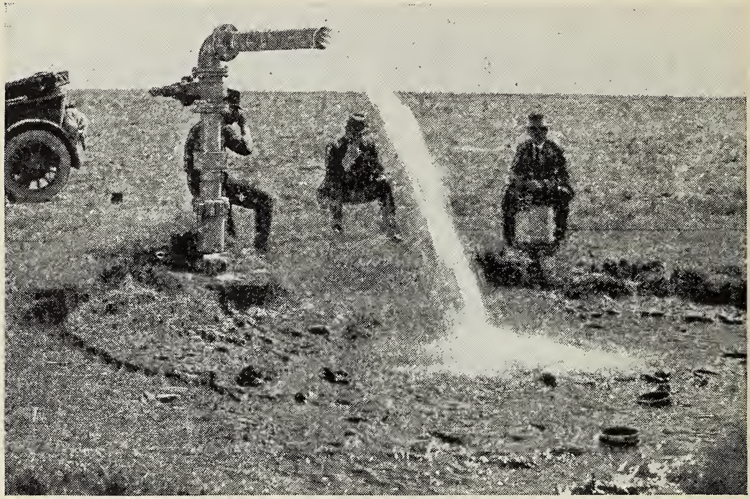
Thanks to the introduction of the merino sheep with its fine fleece, Australia has become the greatest wool country of the world. There are more than 100 million sheep on her pastures. Skilful breeding has increased the average weight of a sheep's fleece from four to eight pounds. Buyers from every country visit Sydney and Melbourne when the season's clip is to be sold. Cattle at first were less attractive; for they yielded little that



Young Beef Cattle in Australia. The cattle are on a "station" or ranch in the drier interior. The photograph should be compared with the preceding one. In the picture the cattle have been "rounded up" by mounted stock-riders into a corral, or fenced enclosure. The withered trees in the background have probably been "ring-barked" to kill them and clear the ground.

could be exported, and the home population to be fed was small. Today the towns are big, and chilling processes make possible the export of beef and cheese and butter to markets overseas. The beef comes from the warmer districts of the north.

As the grasses there are thin and short, the cattle must "range" over wide areas, becoming tougher and leaner than dairy cattle. They can move at great speed and can travel long distances. When two or three years old, they may be "droved" over many hundred miles or railed to the richer pastures of the moister east. There they are fattened for market as fresh beef



An Artesian Bore in Australia. This is a scene in the dry interior of South Australia. The grass is scanty and grows in short tufts; not a single tree is visible. In this picture the water is pouring out at the surface; in other cases it may rise to near the surface and have to be pumped up the remainder of the way.

for Australian towns or to be turned into frozen beef for export.

The dairy products come from the rich pastures of the east coast, which have replaced the original "bush" but have proved too wet for sheep.

Dairying is only possible where people live fairly close together, as along the south-east coast, since there must be a market near at hand either in the towns or in milk and butter factories. The dairy country is, as a rule, more wooded than is suggested by the picture on page 20.

The area fit for stock-raising has been greatly increased by the discovery that, in parts of the interior, water can be raised

Australian-made Auto-Header. The machine with a ten-foot cut is at work in a wheatfield. Since the ears stand at the same height, about 18 inches, and are dry after the long sunshine, they can be stripped off and threshed as soon as cut, which is not the case in the moister climate of the British Isles.

by boring deep wells; these are known as artesian bores. In parts such as South Australia, where long droughts, sometimes lasting over several years, occur, water has been found and tapped by artesian bores, sometimes a mile deep. Many such bores have been sunk by the State Governments. They have made possible the occupation of the dry interior by huge cattle and sheep stations. Bores, too, have been sunk on the stock routes along which cattle are driven to the eastern and southern towns. This supply has done much to lessen the dreadful results of long droughts, when hundreds of thousands of animals may perish from the failure of the surface springs and streams; but the water is often rather salty, and the flow may not last.

Wheat, the third pillar on which Australian prosperity rests, was late in coming into its own. Sheep and cattle may be driven from place to place, but wheat has no legs and Australia no reliable rivers to transport it. There are over 4,000 miles of navigable waterways in the Murray-Darling basin, but they often shrink to disconnected pools just when the harvest is ready. Wheat had to wait for railways, and railways in a stock-raising country seemed hardly necessary. Even now they are none too plentiful, and motor transport cannot deal with grain in vast quantities.

Wheat, like all grain-crops, needs moisture in the growing season and sunshine for the harvest. Along the wetter coastal strips the farmer finds dairying more profitable. The drier, sunnier sheep-country of the interior grows excellent wheat, though the heavy work of clearing the trees, the scarcity of labourers and the unwillingness of the squatters to make room for the farmers have made progress difficult. Inventions like the "stump-jump" plough, which rides over the roots of felled timber, and the "auto-header," which plucks the ears only, have triumphed over the two first difficulties. The auto-header guides the ears into the big drums seen on the machine in the picture on page 23. They are then shaken to separate the grain from the husks. The grain is then poured out into sacks. The straw is not needed for cattle-yards and manure, as it is in England, so that it is left standing; later it is ploughed in. The squatters, naturally anxious for their sheep, have been slow to surrender their pastures to the plough, but science is teaching the more go-ahead farmers to use the drier, inner edge of the sheep-country. New kinds of wheat which need less water have been bred, and such rain as falls is saved by harrowing the top soil after every shower while the land lies fallow, which allows the rain to sink in before the sun can suck it up again. This "dry-farming," as it is called, has produced excellent hard grain.

Merino Sheep. This is some of the better-watered sheep country to the west of the eastern mountains. The surface is flat, grass is plentiful, and gum trees border the river. Notice the folds on the necks of the sheep; they give a greater area of skin and so a larger fleece.

Finally, the growing of many kinds of fruit has provided a valuable source of profit, especially in South-East Australia and Tasmania, where "northern" fruits like apples, pears and plums grow splendidly. Vines flourish in the south, and Queensland produces tropical fruits like bananas and pineapples. December and January are summer months in Australia, and the crops of the fruit-farmer "down under" ripen and are sent to us just when our home-grown fruit is scantiest. At that season people will pay good prices for the fruit which otherwise they must do without.

One means of improving the water-supply of Australia is now receiving the attention it deserves. As in all new countries, the forests have been wastefully cut to give room for pasture and crops. But trees serve a valuable purpose in preventing the rain that falls from being evaporated by the sun. Moreover, their roots entangle the moisture and make its passage into the rivers slower. Forests, therefore, act as valuable reservoirs, and efforts are now being made to increase the tree-cover of areas suitable for this purpose.

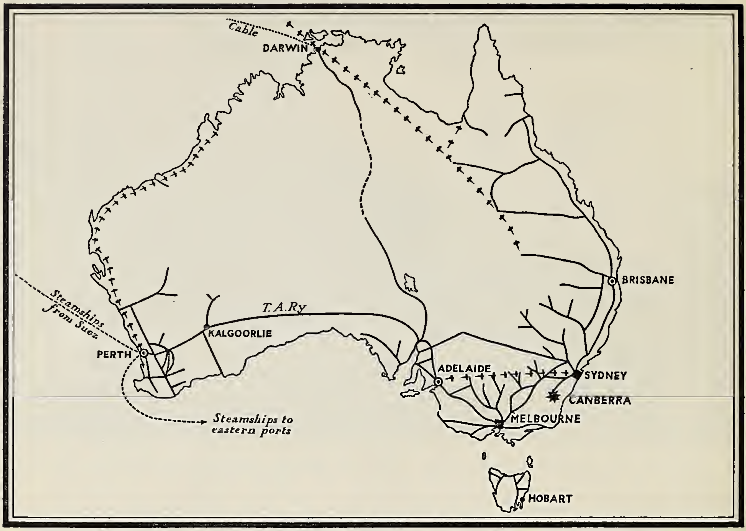
Australian timber is mostly of the kind called " hardwood," especially suitable for furniture-making, railway sleepers and piles to support buildings erected in water. One kind of eucalyptus, the jarrah of the south-western forests, is most valuable for these purposes. The leaves of other kinds yield eucalytpus oil, which we use as a remedy for colds. It has also been discovered that some forms of eucalyptus can be profitably crushed into pulp for making paper and artificial silk. In northern countries it is the " soft-wood " pines, firs and poplars, which are mainly used for these purposes.

Medical Air-Service in Australia. The aeroplane, suitably named the Sky Pilot, is taking on board an up-country patient for rapid transport to hospital. The Australians make much use of air-services both for such medical aid and for mails (see the map on p. 28).

CHAPTER 4

AUSTRALIA TODAY

ALL manufactures beyond those that supply men's simplest needs, like bread, tools and clothing, are late to develop in a new country; for they require more money to start them, more skilled men to work them, and more customers to buy their products than are easily found at first. They also need power to drive their machinery, and power must come from coal or water. There is a plentiful supply of both on the slopes of the east coast of Australia, but before the days of electricity the water was of little use. Coal, however, was mined near Newcastle in New

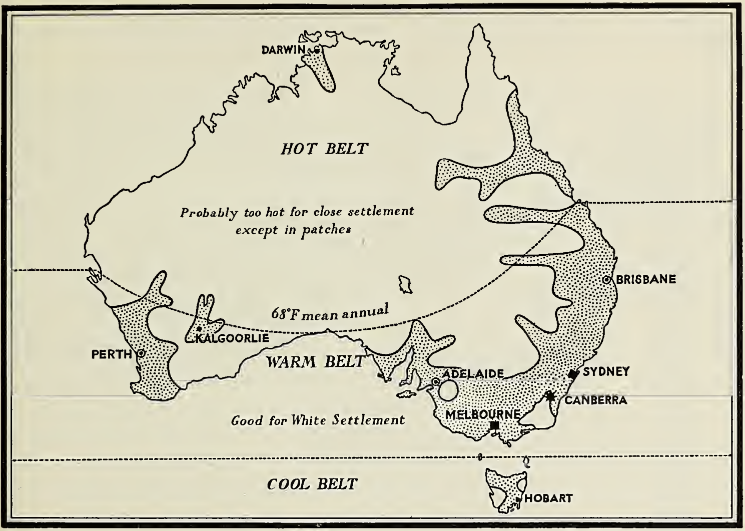


Cable
DARWIN
BRISBANE
T.A.Ry
KALGOORLIE
Steamships from Suez
PERTH
ADELAIDE
SYDNEY
CANBERRA
MELBOURNE
Steamships to eastern ports
HOBART

Some Railways and Air-Routes in Australia. The railway plan is like a wheel with broken spokes. The many separate lines starting from a port on the coast point inland to some producing region and there end "in the air." The rim of the wheel is represented by the lines which join the Queensland Coast and Brisbane to Sydney, Melbourne, Adelaide and Perth (T. A. Ry.=Trans-Australian Railway). North of Perth communication is continued by a regular weekly service of aeroplanes.

South Wales, and the nearness to the sea made its transport easy along the coast. With its help and that of minerals found since, the country is trying to supply all her own needs, though she has not yet succeeded.

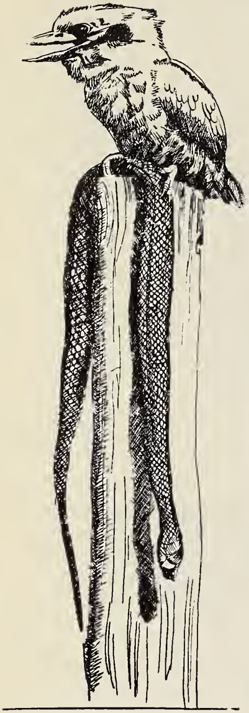
Although, in comparison with her population, Australia has more miles of railway than any other country, she is still very poorly supplied considering the size of the continent. Those she has are chiefly to be found round edges of the land where the


DARWIN
HOT BELT
Probably too hot for close settlement
except in patches
68°F mean annual
KALGOORLIE
PERTH
WARM BELT
ADELAIDE
BRISBANE
SYDNEY
CANBERRA
MELBOURNE
Good for White Settlement
COOL BELT
HOBART

Chief Settled Areas of Australia. The chief settled areas form a band along the east and south-east with two large separate patches in the south-west. They mainly lie where the rainfall is most reliable and in the Warm and Cool Belts rather than in the Hot Belt. " Fingers " of settlement point inland along the railways.

people mostly live, or running, like the broken spokes of a wheel, to the nearer interior only. One line alone crosses the whole continent, connecting Perth with Adelaide and Sydney. Another, following the overland telegraph which joins Adelaide with Port Darwin in the far north, is still unfinished. Nor should we think of her trains as rivalling our own. Tunnels are few, and the inclines steep and winding; speeds are usually less than in England, and double tracks are found only in the thickly populated areas.

Of recent years motor-trucks and caterpillar tractors have

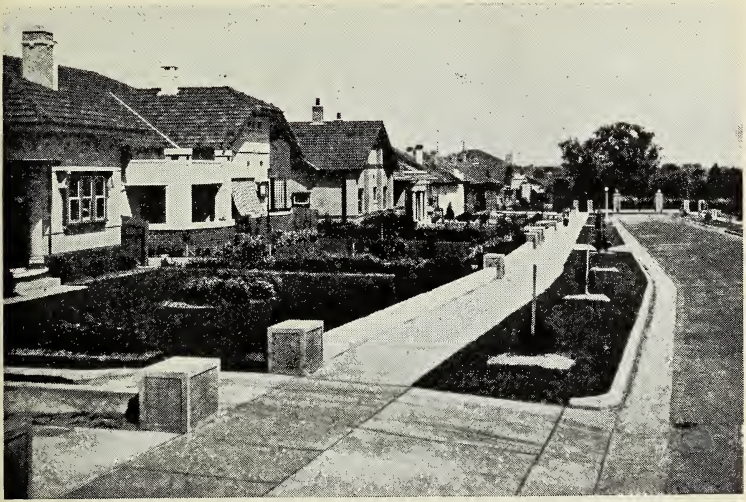


Kookaburra and Victim.
(See page 34.)

done much to bring produce to the railways; and for passenger traffic, mails and ambulance service the Australians have been quick to see the value of air-routes, of which they have thousands of miles already working. In places special medical air-stations have been set up, where doctors and nurses are ready to go off at a moment's notice to help outlying settlers, or to bring in those whose illness or accident needs immediate attention. But coastwise shipping still plays a large part in Australian transport.

The native "blackfellows" were still in the Stone Age state of development when first discovered and show little promise of progressing beyond it. Living as they do by hunting in small family parties, they had no idea of combining to resist the newcomers and merely withdrew into those parts of the country where the white men were unlikely to follow. In all that concerns Australian civilisation the blackfellows, one hundred times less numerous already than the white men, are of no importance.

The white population is naturally thickest near the coast, particularly in the south-east, and thins out gradually to the desert interior. Australia, like England and the United States, is finding that many of the people brought up to the lonely and toilsome life of the back blocks are leaving them for the more sociable and civilised life of the towns. But this movement is due, in part at least, to the machines now used on the land. Inventions originally intended to do the work of men who could not be found to do it are now making many

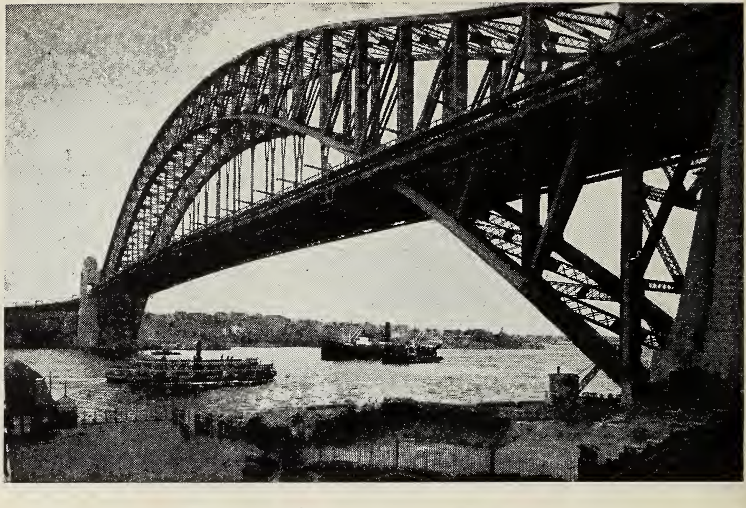


Typical Scene in a Melbourne suburb. This suburb has the appearance of a garden city. The wall that fronts the street is low, so that flowers and lawns can be seen by passers-by. The side-walks, too, are fresh with grass plots, and trees are planted, which later will add to the beauty as well as giving shade. The whole street, in fact, looks like one long garden.

of those already there unnecessary. Far too many, therefore, of her scanty seven million people are now in the state-capitals.

The need for dealing rapidly with all goods for export has led each state to spend its money on improving a single port rather than to waste its money on several rival harbours. So most roads and railways lead to the port-capitals—Brisbane, Sydney, Melbourne, Adelaide and Perth. Smaller ports or inland townships have less to offer in the way of attractions or entertainment. The only other town with over 50,000 inhabitants is Newcastle.

An Englishman landing in one of the south-eastern capitals would find much to remind him of home. The life and language



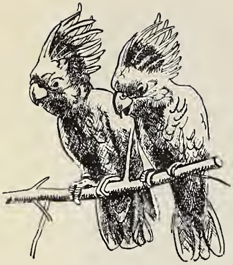
Sydney Harbour Bridge. Sydney, a city of over a million inhabitants, sprawls along both the northern and southern shores of a long inlet, called Port Jackson. To connect them this bridge has recently been built. The height can be guessed from that of the ferry-boat which is passing underneath. Many of these still ply up and down and across the bay.

of the people, their religion and government, their food and their amusements hardly differ from those he left 12,000 miles behind. But he would find the cities laid out on broader lines, with wider streets and larger parks; in the suburbs, no closely packed rows of villas, but villages of bungalows standing each in its own garden. The sun shines more brightly than in England; for even Melbourne is 800 miles nearer the equator than our own "Cornish Riviera." It would seem to travel the wrong way across the sky, standing north instead of south at noon.

Forest in the South-West of Australia. The map of the natural vegetation shows that the south-west is covered with forest. The typical tree of Australia is the gum or eucalyptus, of which there are many kinds. The two men in the picture give some idea of the great size of the trees. The gums here are karri or jarrah, which have a close-grained hard wood, something like mahogany.

Christmas as the season for picnics and sea-bathing might surprise the visitor till he remembered that Australians play cricket when we are playing football.

He would have to travel a long way up country before he met a really uncivilised native blackfellow, who, by the by, is really brown; and he would see fewer of the animals and birds that are shown in the margins of these pages than he might



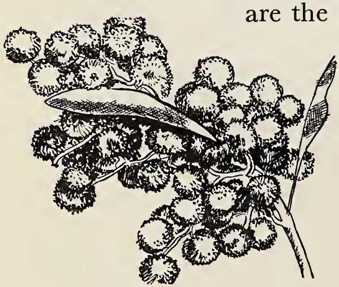
Cockatoo.

in the Zoo at home, unless he left the cities far behind.

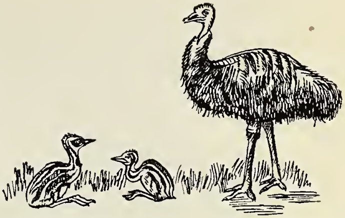
The native animals of Australia are peculiar, and none of them are any use to the white man, who had to bring all his live-stock from Europe. He even brought camels from Asia to carry loads in the deserts of the interior, though the motor-truck is now replacing them. He also introduced the rabbit, which spread till it is now an actual danger, destroying the grass on the sheep and cattle runs and nibbling down the seedling trees and crops. Vast sums have been spent on fencing and the destruction of rabbits, but so far they have not been much good.

To an Englishman, however, on landing, only the birds, trees and flowers would be strange, and not all of these; for English trees and flowers grow well in Australia and soon learn not to open their buds in the southern winter, and the English sparrow, like the rabbit, has made himself far too much at home.

Away from the cities, however, the true Australia begins to appear—a land, at first, of beautiful trees, gorgeous flowering shrubs and towering tree-ferns, the home of the kookaburra or laughing kingfisher, the cockatoo and the rare but strangely beautiful lyre-bird. The typical Australian trees are the gums and the wattles, of which there are many kinds. In the bush or forest the trunks rise tall and straight with bare stems. At the top they are crowned with tufts of small grey-green leaves. In more open country the gums take rather the

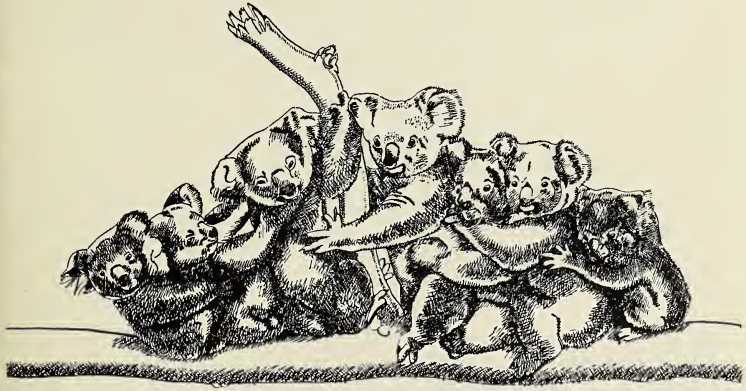


Golden Wattle.



Emu with Chicks.

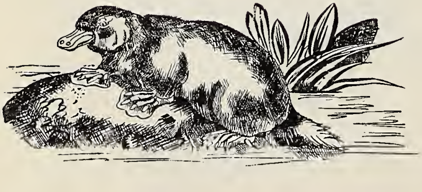
shape of an English oak. In both cases they give less shade than English trees, and let in air and sunlight, as is shown by the thick carpet of ferns and other plants in the picture on page 33. The wattles or acacias are flowering trees of many hues with drooping branches. The golden wattle or mimosa has been chosen as the emblem of Australia. On the thirsty plains of the interior, the " land of far horizons," where the emu and the kangaroo still roam, the acacias turn their leaves edgewise to the sun, and so resist the drought that prevents the growth of the grass. For the sun is here all-powerful, and the last of the gum trees, the mallee, dies out inland in low scrub growth. This is " the wide



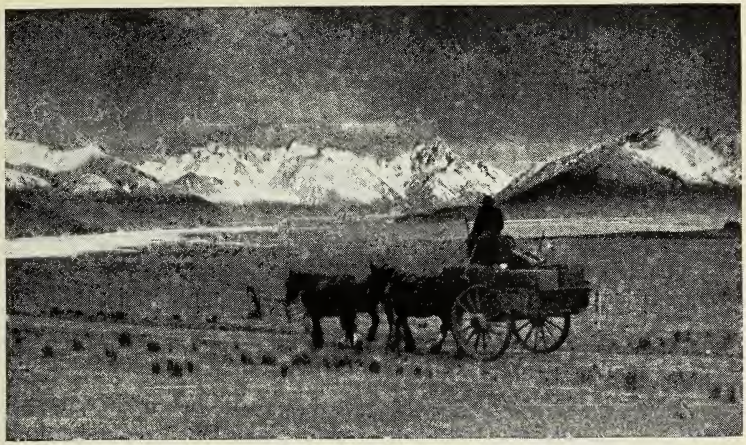
Koalas.

brown land" of the poetess who knows her native Australia in all its aspects, and loves;

> A sun-burnt country,
>   A land of sweeping plains,
> Of ragged mountain ranges,
>   Of droughts and flooding rains.
>
> DOROTHEA MACKELLAR.



DUCKBILL.



The New Zealand Alps above the Canterbury Plains in South Island. The long line of snow-clad summits overlooks the broad valley which has been filled with soil from the mountains. Much of the grass is coarse and tussocky, but it provides feed for sheep. The waggon is carrying the last of the season's wool which will be sent down to Christchurch.

CHAPTER 5

NEW ZEALAND

AO TEA ROA[1] is the native name for New Zealand, for "The Long White Cloud" of the snow-capped Southern Alps was the first glimpse the Maoris had of their future home. They came, about eight hundred years ago, from islands far out in the Pacific and found few inhabitants to dispute their right to settle there. The high, broad-backed chain of mountains runs all the length of South Island. They rise steeply from the west coast, but leave space on the eastern side for the rolling

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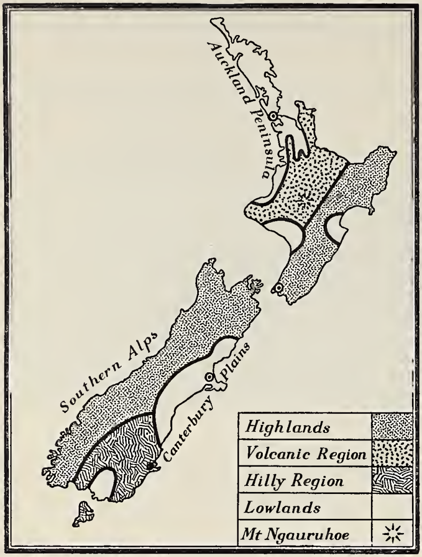
[1] Ao Tea Roa is pronounced Ah-o Tay-ah Ro-ah.

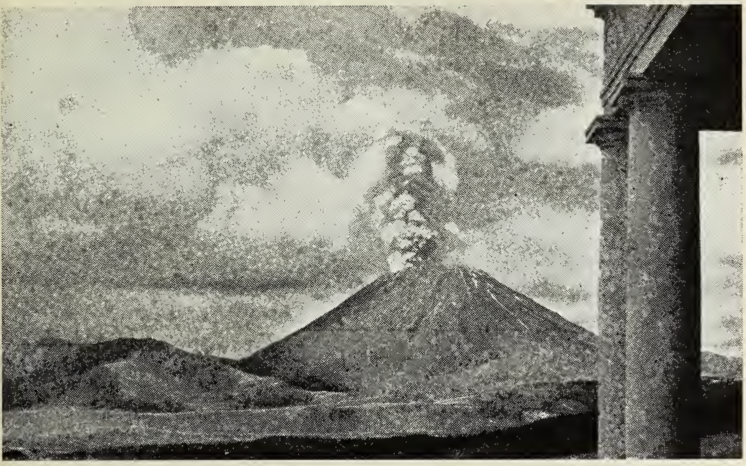


Surface Divisions of New Zealand. Compare closely with the map in the atlas. Note in particular the position of the Canterbury Plains in South Island and the three separated Lowlands in North Island.

foot-hills and flats of the Canterbury Plain. The same range is continued into North Island as a series of ridges, but here the mountains are lower, and they swing over to the eastern side. Across the centre of North Island, from south-west to north-east, runs a line of volcanic cones, boiling springs, and spouting geysers; but only one of the cones is now active, though the island suffers at times from earthquakes.

Though New Zealand gets an amount of sunshine which we in England may envy, it has a much wetter climate than Australia. But the two islands differ considerably. Across the wide Southern Ocean the westerly winds blow against the west coasts of South Island. Their storms spread ample rain far and wide over that island, though less of it reaches the sheltered eastern coasts. The winds are fiercest in the strait that separates the two islands, and the passage between them is apt to be rough. North Island often enjoys the breezes of the south-east trade winds and less vigorous, though ample, rains.

The Dutchman, Tasman, was the first European to visit New



Mt. Ngauruhoe in Eruption, North Island. The mountain is one of a line of volcanic cones through the centre of North Island. Most of them are dead or dormant, but Ngauruhoe is shown by the picture to be very much alive. A cloud of steam and dust is issuing from its crater. The symmetrical cone is composed of lava and ash. Much of the lava country is bare and barren.

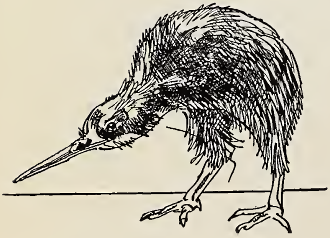
Zealand. That is why it has a Dutch name. But no one followed him till Captain Cook, nearly 140 years later, explored its coasts on the voyage that brought him to Australia. It was another 60 years before the first English settlers arrived, in 1840, to found the last of our overseas Dominions.

English missionaries were already in the country, but the home Government refused to claim the islands until the fear of foreigners taking them caused it to change its mind. Progress was slow at first, for the bush was hard to clear, and the Maoris, a brave and intelligent race, fought fiercely to retain their lands in North Island, where most of them dwelt.

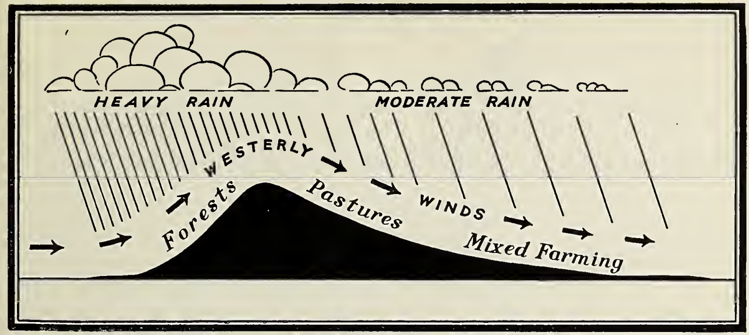
A Harvest Scene on the Canterbury Plains. The rolling country-side is well cultivated, sheep-pasture and ploughland mixed. The Canterbury Plains have been called the granary of New Zealand. It might be a scene in England, except that there are no hedges.

By 1850 Auckland and Wellington had been founded in North Island, and Christchurch and Dunedin in South Island. The wide Canterbury Plain, with no forests to clear, proved a paradise for sheep farmers, who found in the wool of their flocks the main source of their prosperity. Meanwhile the discovery of gold in both islands brought a large increase in the population, which was not wholly lost when the chief deposits were worked out.

Then came the invention of freezing processes, and frozen mutton could be exported along with wool. English butchers began to

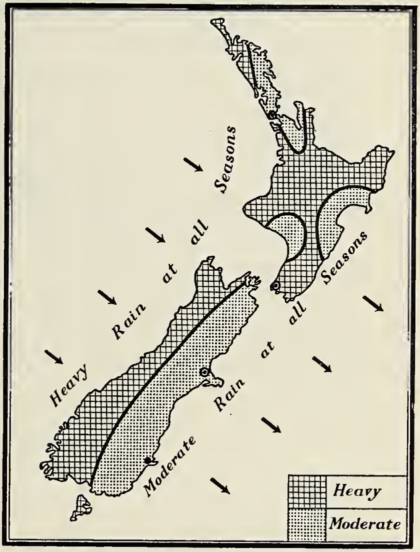


Kiwi.

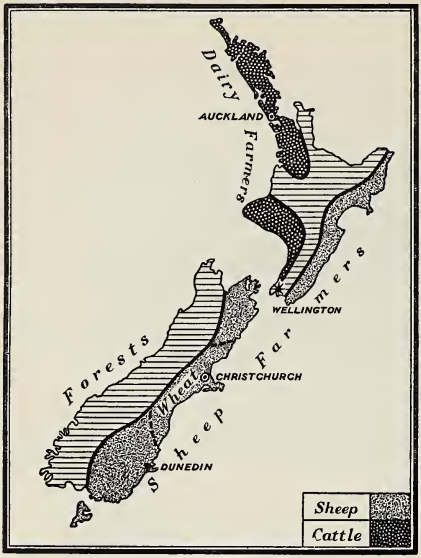

HEAVY RAIN
MODERATE RAIN
WESTERLY
WINDS
Forests
Pastures
Mixed Farming

Section from West to East across South Island, showing winds, rainfall, and the use of the land. Compare this with the next two diagrams, noting that the forests (in South Island) and dairy farmers (in North Island) are on the wetter western side, the sheep and wheat farmers on the sunnier eastern side.

offer their customers "Canterbury lamb," and though the buyers probably imagined it to have been killed in Kent, they bought it and found it good to eat. Thus the sheep became more valuable than ever to the New Zealand farmer, and South Island became the richest part of the colony. But do not think that the Canter-


Heavy Rain at all Seasons
Moderate Rain at all Seasons
Heavy
Moderate

Distribution of Rainfall in New Zealand.



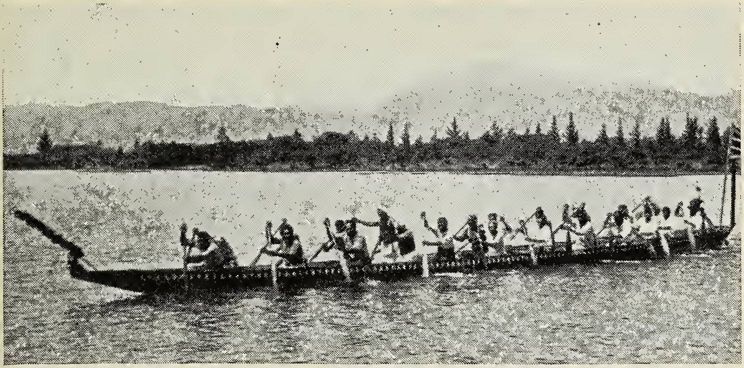
Chief Occupations of New Zealand.

bury Plain is now merely one vast sheep-run. It recalls rather the mixed farming and small fields of an English landscape without the hedgerows; for it is the granary of New Zealand.

Before 1900, North Island had begun the second industry on which New Zealand's prosperity now depends. The Maori wars, which so seriously disturbed that island in its earlier years, were almost forgotten. The bush was cleared and English grasses sown. Dairy herds flourished in the mild, moist climate, and they have increased enormously in the last thirty years. The herds live in the open, winter and summer. New Zealand butter and cheese can now compete in the English market with the products of Denmark, just as her frozen lamb competes with the meat from Argentina.

Of the 1,500,000 inhabitants nearly a million live in North Island. A much larger proportion than in Australia—nearly half in fact—are country dwellers. Few industries beyond those which prepare the produce of the land for shipment overseas have yet developed.

The 70,000 Maoris were for a long time divided into groups called " canoes," recalling the original companies in which



A Maori War Canoe, now used only on festal occasions. The art of carving and ornamenting canoes and dwellings was carried to a high level. Some decoration can be seen on the pointed prow and on the side of the canoe.

they reached New Zealand from their earlier home. Many of them have been eager to receive education, and some have risen to high positions among the white population of the land.

Nowhere in the Empire, not even in Australia, is the white population so truly British as in New Zealand. Auckland was the first capital and is still the largest city. It is built on a narrow neck of land between two inlets, and its citizens will not admit that even Sydney Harbour can match the beauties of their island-dotted eastern gulf. But Wellington, more centrally placed, is now the capital. It is built on the steep spurs of a bay which is wide and deep enough to accommodate at its quays the largest liners, and it is sheltered from the winds of Cook Strait.

Christchurch, in South Island, was founded by members of the Church of England, and it has the appearance of an English cathedral city. But it is also the City of the Plains, busy with freezing works and woollen mills and the shipment of its products through its port eight miles away on the sea. Dunedin was founded by Scotsmen, who gave it the old name of their own Edinburgh. A statue of Robert Burns, the Scottish poet, adorns the city; and the broad Scottish accent is often heard. It is a hill-girt city beyond the southern end of the Canterbury Plain amid surroundings that remind one of the Scottish Uplands with their flocks and herds.

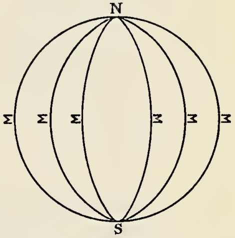
When the white men first arrived, the islands were more than half covered with dense forests. They consisted of beech and palms and such valuable timber as the kauri pine, a hard yet easily-worked wood highly prized by builders. Reckless clearing threatened to destroy it all, till the Government interfered and began to replant the forests. The animal life was peculiar. There were no native four-footed animals except dogs and rats, which the Maoris had brought with them. There were no snakes, but many birds, including a number of kinds that are quite unable to fly, like the kiwi and the penguin, which is found on the small islands to the south.

CHAPTER 6

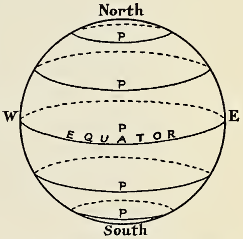
PLACE AND TIME

FAR out in the Southern Ocean to the south-east of New Zealand lie the Antipodes Islands. They are a very unimportant part of the British Empire, but they have an interesting name. It seems to promise that, if you could run a huge knitting-needle from some place in England through the centre of the earth, you might hurt someone on those islands; for the name means that the feet of people there, if anybody lived there, would be opposite our feet. Actually, however, the experiment would not quite work, even if it were possible; for the Antipodes Islands are not directly underneath us, though their discoverers thought they were.

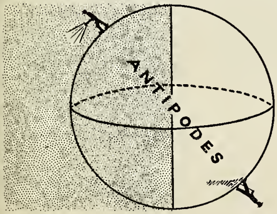
If two places are really opposite each other on the earth's surface, there must be just half the circumference of the globe, or nearly 12,500 miles, between them. But we cannot prove this by direct measurement: we must have lines on the globe, or map, to guide us. These lines, which, on the globe, are all circles, are drawn both east and west and north and south. The first of them, the Line, as sailors call it, is the equator, half-way between the poles. Parallel to the equator other circles are drawn, growing smaller as they approach the

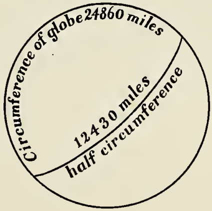


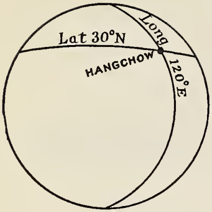
Meridians of Longitude
(See next page.)



Parallels of Latitude.







N
Equator
Meridian of Greenwich
S

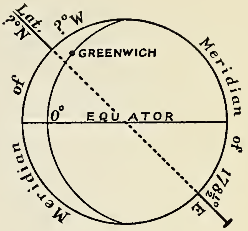
poles. These we call parallels of latitude, and by them we can tell how far north or south of the equator a place lies.

But we must also know how far east or west it is, and so we need another set of circles running north and south. All these circles will be of the same size, and they will all cross at the poles. But we think of them only as semi-circles running from pole to pole, and we call these semi-circles meridians of longitude, and the first of them is the meridian which passes through Greenwich Observatory. All measurements east or west are made from the meridian of Greenwich.

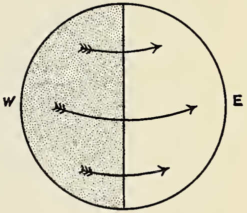
This line is described as being in longitude O degrees, and all distances from it are reckoned not in miles but in degrees, of which there are 360 in every circle. But you will not find any parallel or meridian numbered with so high a figure as that. We reckon distances the nearest way round the equator from the meridian of Greenwich, so that no place can be more than 180 degrees away, half the circle being in east longitude and half in west longitude. And for distances north or south we need still smaller numbers; for we reckon only by quarter-circles from the equator to either pole, and the poles are only 90 degrees (90°) from the equator.

Suppose, then, we want to find the town of Hangchow. If we know that it lies in lat. 30° N. and long. 120° E., we have only to find the parallel of 30° N. and follow it across the map till it cuts the meridian of 120° E., and without any difficulty at all we find Hangchow, at the head of a bay in China.

No parallel or meridian is shown passing through the Antipodes Islands, but we can reckon their position from the nearest lines we can find. We discover that they lie in lat. 49½° S., long. 178½° E.; so now we can find out for ourselves whether they have a right to their name. Push the imaginary knitting-needle in the other way and it will come out in lat. 49½° N., long. 1½° W.

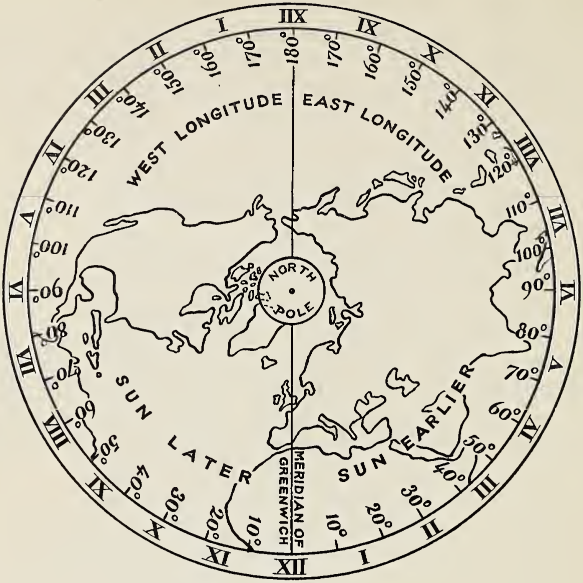


The question of the time in different parts of the world depends entirely on what we now know about longitude.



The earth turns on its axis from west to east, bringing the same countries round to the same positions every twenty-four hours. Once a day, therefore, every place on the earth will be brought opposite the sun, and places on the same meridian will be opposite the sun at the same time each day, at the hour we call noon. But to us it seems that we stay in the same place, while the sun moves in the reverse direction, that is, from east to west. Since the globe with all its 360 degrees of longitude turns eastward under the sun once in twenty-four hours the sun appears to travel round those 360 degrees in a westward direction in the same time, that is at the rate of 15 degrees every hour. A place 15 degrees east of us sees the sun overhead an hour earlier than we do; a ship on the Atlantic 15 degrees west of us must wait an hour longer for its noon.

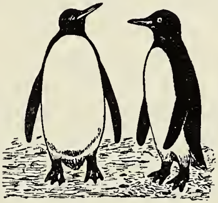
Thus it is noon at Hangchow (120° E.) eight hours before it is noon at Greenwich, or, to put it another way, it is only 4 o'clock in the morning at Greenwich when it is 12 o'clock noon at Hangchow. At Philadelphia (75° W.), on the other hand, noon comes five hours later than with us, so that it is 5 o'clock in the afternoon in England when it is only mid-day in Philadelphia. And at all places 180 degrees from Greenwich it is midnight when it is noon with us.


WEST LONGITUDE
EAST LONGITUDE
NORTH POLE
SUN LATER
SUN EARLIER
MERIDIAN OF GREENWICH
XII
I
II
III
IIII
V
VI
VII
VIII
IX
X
XI
180°
170°
160°
150°
140°
130°
120°
110°
100°
90°
80°
70°
60°
50°
40°
30°
20°
10°

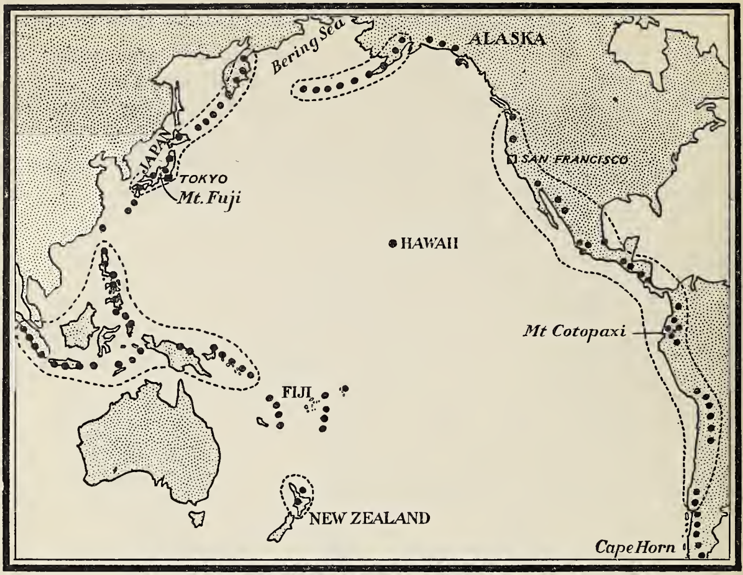
How Longitude alters Time.

Strictly speaking, though every place due north or due south of you right away to the poles has the same time of day as you, because they are all on the same meridian, your noon, and therefore all your other hours, should alter if you walked east or west. But that would lead to serious confusion, and so every country, or at any rate every region, agrees to keep the same time within its own limits, choosing some convenient meridian for the standard as we have chosen the meridian of Greenwich.

The seals and penguins that visit the barren rocks of the Antipodes Islands are not interested in standard times. But it should now be possible to work out the time in England when it is real noon for them. This will be the moment when the sun in the Antipodes stands at its highest point in the sky and casts their shadows due south.



PENGUINS


Bering Sea
ALASKA
JAPAN
TOKYO
Mt. Fuji
HAWAII
SAN FRANCISCO
Mt Cotopaxi
FIJI
NEW ZEALAND
Cape Horn

The Pacific Basin and its Ring of Volcanoes. The black dots show the chains of volcanoes which surround the Pacific Ocean. Two of them, which are mentioned later, are named—Mt. Fuji in Japan, Mt. Cotopaxi in South America. The broken lines enclose the chief groups.

CHAPTER 7

THE PACIFIC BASIN

THE vast ice-cap that covers the Antarctic Continent lies in the midst of the greatest oceans of the world. Round it flow the broad, storm-tossed waters of the Southern Ocean, from which three other oceans stretch far northward—the Atlantic, the Indian and the greatest of all, the Pacific.

The Pacific Ocean covers a third of the whole globe—more

Mt. Fuji in Japan, now dormant, is one of the volcanoes which line the coasts of the Pacific Ocean. The blunt top (compare Mt. Ngauruhoe on p. 39) shows where the crater lies. The cone rises 12,000 feet with graceful curves and is capped with streaks of permanent snow. The lower slopes are forested.

than all the continents put together. A fast mail-boat takes nearly three weeks to cross it from Japan to Panama. It is enclosed by high mountain ranges, which plunge steeply beneath its waters to some of the deepest hollows in the world. On the east the mountains run from Cape Horn to Alaska, and then, after a break at Bering Strait narrower than the Irish Sea, they continue down the west side. But here the line is often under water, and only its peaks stand out in festoons of islands from Japan to New Zealand.

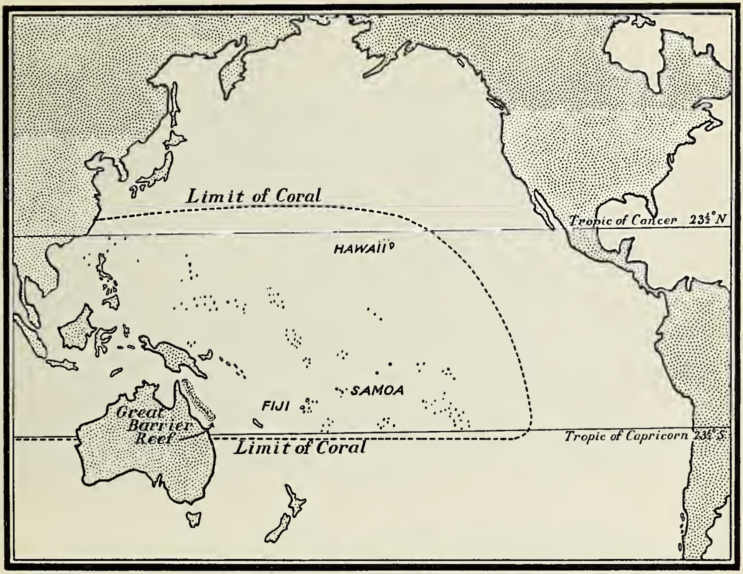
The whole border is studded with volcanoes. Nowhere so constantly as on the shores of the Pacific are we reminded of the thinness of the earth's crust on which we live. It covers an interior mass at enormous pressure, like that of the steam

The Results of an Earthquake. Japanese houses, except in some coast towns, are mostly built of wood, one storey high, for fear of earthquakes, but closely packed. This picture shows the sides of houses fallen out and roofs fallen in: planks, tubs, railings, etc., lie in confusion by the waterside.

in an engine boiler. Wherever there is a weak spot, molten material bursts through from time to time, throwing out dust and ashes and lava with clouds of escaping steam and gases. The pipe of a volcano, round which the heap of fragments lies piled in a cone-shaped mountain, is in fact a safety-valve of the earth. Cotopaxi in South America, Mt. Ngauruhoe in New Zealand and many other volcanoes are serving this purpose today.

To the Japanese the dormant Mt. Fuji is sacred, and many make pilgrimages to the shrines on its slopes. It often appears on Japanese screens, pottery and stamps.

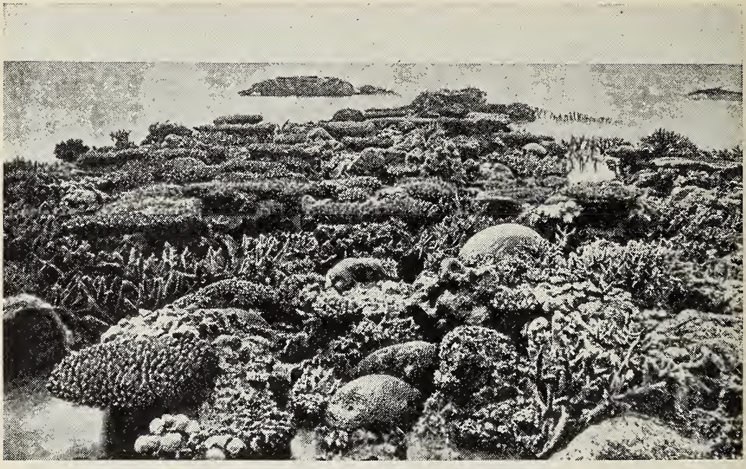
Since weak places generally run in lines, volcanic cones are commonly found in long chains, as they are round the Pacific.


Limit of Coral
Tropic of Cancer 23½°N
HAWAII
SAMOA
FIJI
Great Barrier Reef
Limit of Coral
Tropic of Capricorn 23½°S

Distribution of Coral Islands and Reefs in the Pacific. The broken line encloses the coral islands and reefs. The map shows that nearly all lie within the two Tropics, 23½ degrees from the equator. The Great Barrier Reef (off the coast of Queensland) is marked. See photograph, p. 54.

Such regions are particularly liable to earthquakes. In recent years Tokyo in Japan and San Francisco in the United States have suffered severely from these disturbances.

Earthquakes and volcanic explosions are terrible in their effects, but sometimes the pressure is relieved without violence. The lava merely boils up through some rift in the ground and floods the surrounding country. Lava flows of this kind occur in Hawaii. In some places the old lava floods have decayed into

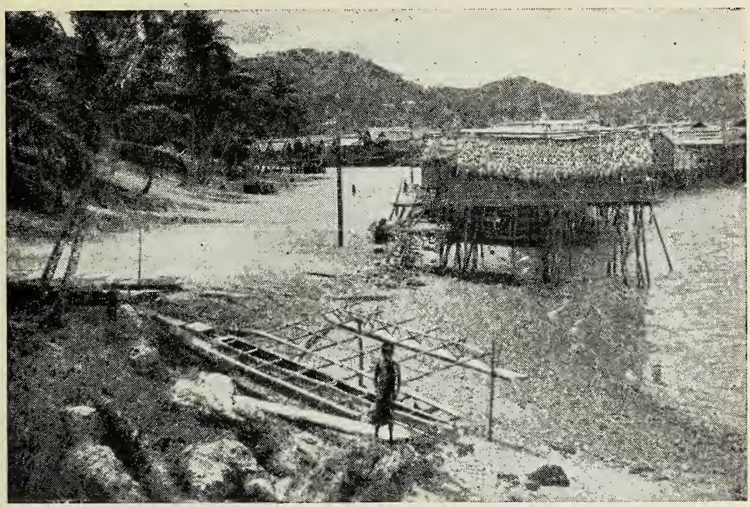


Part of the Great Barrier Reef. As shown in the picture, coral takes many shapes. Some are like sponges. Others show short, close-packed branches. They are also of many colours. Generally they are white. They show many tints, due to the tiny plants that cover their surfaces. There are fishing stations on the Reef, occupied chiefly in gathering large sea-slugs, a delicacy in China. One of these slugs is seen in the centre of the picture.

fertile soil, as on the Darling Downs behind Brisbane, where all eruptions ceased thousands of years ago.

The central Pacific is dotted, especially in its southern half, with a host of little islands rising from submarine highlands. Sailors, viewing them from the sea, divide them into two kinds, the " high " and the " low " islands. The coral polyp, a tiny creature that lives only in warm, clear sea-water and never below a certain depth, has helped to make both kinds, but particularly to the formation of the " low " islands.

The polyps, themselves soft-bodied, find in the water the material for their hard covering. They pile cluster upon cluster of their branching villages on the ruined dwellings of polyps that



A Sea-Shore Village in New Guinea. The dwellings have walls of interlaced sticks and roofs of thatch made from the leaves of coco-nut palms, seen on the left. They stand in sheltered water, raised on piles for protection against beasts and men. In front is a typical canoe. The outrigger rests on the water and prevents the canoe overturning.

lived before them, till the whole mass forms a reef at sea level. These reefs are built either close to the shore or on submarine mountain tops, but always in the Hot Belt. The largest in the world is the Great Barrier Reef, which runs for more than 1,000 miles along the coast of Queensland, making a natural breakwater to shelter coast-wise shipping. Through the Reef there are openings opposite the muddy mouths of rivers, because the coral only lives and builds in clear sea-water.

The " low " islands are little more than narrow strips of coral sand surrounding a sea-lake or lagoon. In storms the sea will sometimes sweep right over them. The " high " islands are the

Cutting Copra in Fiji. In the background is a plantation of coco-nut trees, with tall trunks and crowns of spreading foliage, beneath which the coco-nuts grow. The man seated on the ground is an Indian, of whom many have been brought over to work the plantations of coco-nut and sugar. Having broken open the nuts with the axe on the right, he is now separating the white meat from the husks with a stout knife and piling them apart on the left.

exposed tops of mountain masses, rich with volcanic soils and watered by the rains of the trade winds. Each consists of a fringing coral reef, a belt of fertile lowland, and central forest-covered mountains.

The islands are interesting for the lives and customs of their dark-skinned inhabitants and valuable for their products. On the coast-land stand the palm- or grass-thatched dwellings of the natives, amid gardens of bananas, bread-fruit, yams[1]

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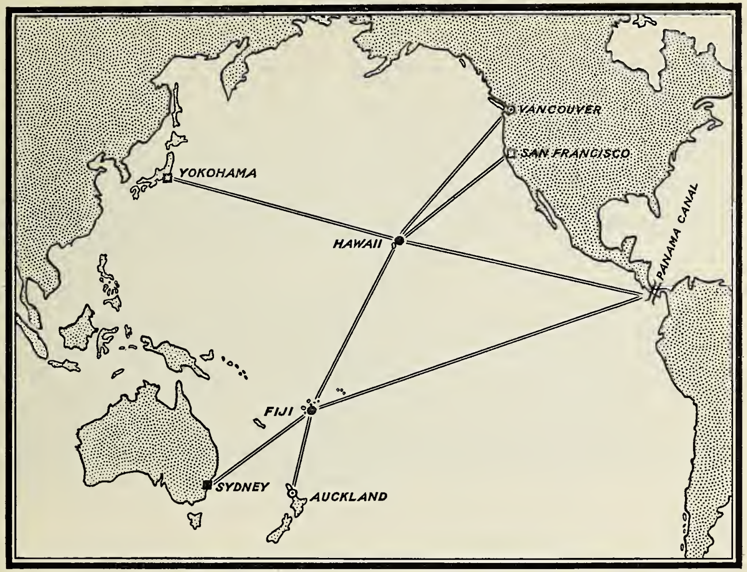
[1] "Sweet potatoes."



Some Chief Steamer Routes and Ocean Junctions in the Pacific, showing that the Hawaii and Fiji Islands are important junctions for the great ocean highways between (*a*) North America and Japan, (*b*) North America and Australasia, (*c*) Panama Canal and Japan and Australasia.

and taro[1]; for they are tropical gardeners, growing all they need. With the ocean at their doors and many island stepping-stones, the people are as much at home on the sea as ashore. In their outrigged canoes they fish and trade. They have migrated vast distances, like the Maoris, in voyages that for daring and seamanship deserve to rank with those of Columbus.

Into this Pacific world during the last hundred years foreigners have entered and divided the islands between them.

[1] Another food-plant like the potato.

Of the four quarters of the ocean it may be said roughly that the south-west is British, the south-east French, the north-west Japanese, and the north-east American.

Copra, the dried meat of the coco-nut, is collected from all the islands by traders, who sell it to oil and soap factories. But the coco-nut has many other uses. Its meat supplies food, its milk a refreshing drink. Its leaves make baskets, or thatch the native huts, which are built of timber from the same tree. The fibre from the shell of the nut is used all over the world for matting, ropes and brushes.

The two most important groups of islands are Hawaii and Fiji, which have other important products in addition to the coco-nut. The Americans grow sugar and pine-apples in Hawaii, which has also become an American naval base and a favourite tourist resort. Fiji supplies sugar to the Australian market. Both groups are important wireless and submarine cable stations and convenient junctions on ocean travel routes. Since the Pacific Islander will only work by fits and starts, " coolies " (labourers) from India now outnumber the natives in Fiji, as do the Japanese in Hawaii.

In the Straits of Magellan. The straits separate the island of Tierra del Fuego from the mainland.

CHAPTER 8

SOUTH AMERICA : A BIRD'S-EYE VIEW

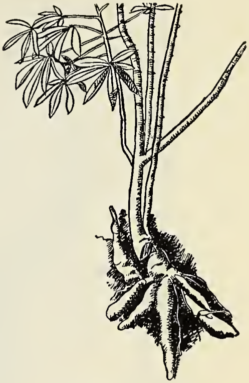
FIVE thousand miles of wind-lashed water divide New Zealand from the Horn, the tip of the great claw that America stretches towards the Antarctic. Cape Horn is actually an island. A much larger one lies north of it, and then come the Straits of Magellan, after which there is no break in the 8,000 miles of land that reaches to Alaska. Many men, from the days of Columbus almost to our own, looked for a passage through it, but till the Americans cut the canal at Panama they found none better than the Portuguese Magellan's.

Indian Fishing.

Though some backward Indians remain in a half-naked, wild state, many now wear garments obtained from Europeans. They are mostly of mixed blood, Portuguese and Indian. They live near the rivers, so that they have a treble larder: manioc planted in the ground, small game hunted with bow and arrow or blow-pipe in the forest, and fish speared in the river.

Magellan sailed down the east coast of South America on his way from Portugal to the Moluccas or Spice Islands in the East Indies. In 1519 he found the Straits that bear his name. One of those on board wrote—"We found, by a miracle, a strait . . . a hundred and ten leagues long . . . and it issues in another sea which is called the Peaceful Sea (Pacific); it is surrounded by very great and high mountains covered with snow. . . . I think there is not a more beautiful country or a better strait than this one." But Magellan himself, deserted by his largest ship, thought otherwise; he speaks of "the cold and frozen mountains and the great discomfort to our men." The climate is treacherous, and there is much fog.

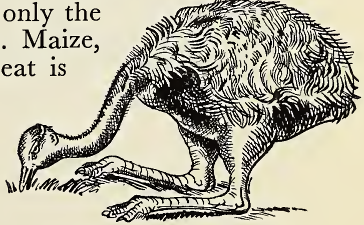
Between Panama and the Horn, from 12° North to 55° South, lies the tapering continent of South America. Its coast-line is as compact as Australia's, but opens where great rivers reach the sea. No explorer could miss the mouths of the Orinoco, the Amazon and the Parana, as they did the mouth of the Murray. The Amazon is the greatest river in the world, but its banks are walled with almost impassable forest, and the Orinoco is blocked by rapids. Only the Parana is really useful to the states that border it.



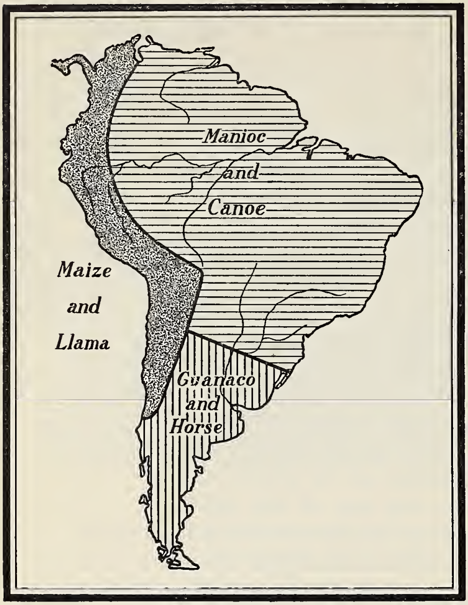
Manioc Root.

Like Australia, South America is still a land of pioneers. A broken fringe of civilisation surrounds an almost empty continent. On the west the Andes form a barrier far more formidable than the Sydney settlers found in the Blue Mountains. Much of the interior is still unexplored, the home of Indians as wild today as when Europeans first arrived. The inner boundaries between the different countries are in places still undecided. South America was one of the earliest parts of the New World to be discovered, but colonisation has advanced almost as slowly as in Australia, though drought, as Australia understands it, is rare. It is a country of rain-drenched forests and rolling grass-land, which could support millions more colonists if the Governments were strong enough to guarantee them peace and security.

The Incas of Peru reached a higher state of civilisation than any other Indians in South America, but their empire was destroyed by the greed of their Spanish conquerors, and only the ruins of their great buildings now remain. Maize, or Indian corn, was to them what wheat is



Rhea.



Foods and Means of Movement of Indians in South America, showing the three divisions of South America: (*a*) in the mountain lands of the west, where the Inca Empire arose, the agricultural Indians planted maize and used (and still use) the llama as a pack animal and as a wool-producer; (*b*) on the grassy plains of the south-east they hunted the guanaco for its meat and skin and travelled on foot until the Spaniards introduced the horse, which they soon learned to tame; (*c*) in the north-east they made a kind of bread (manioc) from the root of a plant, and hollowed canoes out of the tree trunks for fishing on the many rivers.

to us, the most important article of food, and such it remains to the natives of today.

The Indians east of the Andes have never produced a civilisation of their own. In Brazil they live largely on food prepared from manioc, a root from which tapioca is made. This they vary with fish killed with bows and arrows in the rivers, or birds and small animals shot with their blowpipes in the forest. In the cooler south, the Indians of the plains were meat-eaters, hunting the guanaco[1] and the rhea with the bolas, a sort of threefold hobble which is flung with a spin and wraps itself round their legs. Horses and cattle, unknown till the Spaniards introduced them, increased rapidly on the open grass-land of the pampas, and the Indians became skilled horsemen. The gauchos, the cattlemen of the south, are their half-breed descendants, as clever and as reckless as the wildest "cow-punchers" of North America. (See p. 77.)

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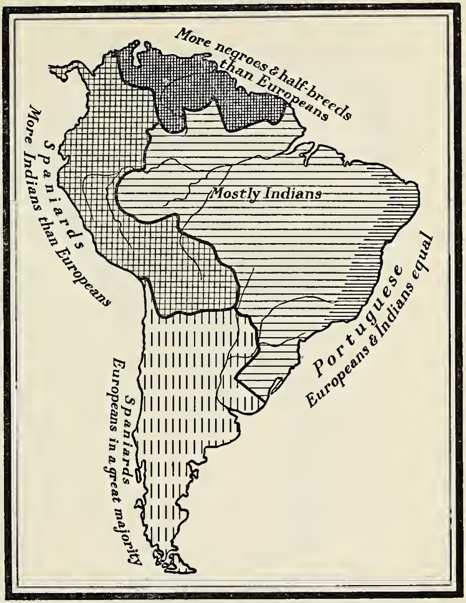
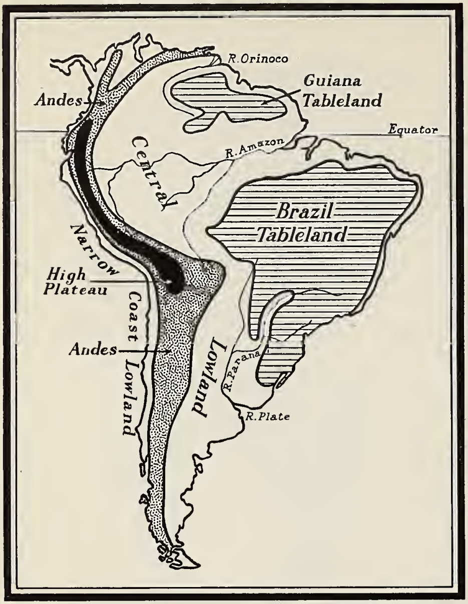
[1] The wild llama. A tame one is shown on p. 69.


More negroes & half-breeds than Europeans
Spaniards
More Indians than Europeans
Mostly Indians
Portuguese
Europeans & Indians equal
Spaniards
Europeans in a great majority

Races of South America, Brazil was colonised by the Portuguese, the rest of South America (except the three Guianas) by the Spaniards. In Argentina and Chile families of European descent are in a great majority. Elsewhere there has been much mixture of blood.

People from southern Europe have no objection to mixing and marrying with coloured races. Both Spaniards and Portuguese have married freely with the Indians, a race far superior to the Australian natives, if not also to the Maoris and Pacific Islanders. Pure-blood descendants of the early colonists are rare, except in the south, and proud of the distinction. But the real dividing line is drawn between the wealthy land-owner and the pauper labourer, native or immigrant. The cities are magnificent, the estancias or "stations" of the land-owners often luxurious, but the villages are poverty-stricken.

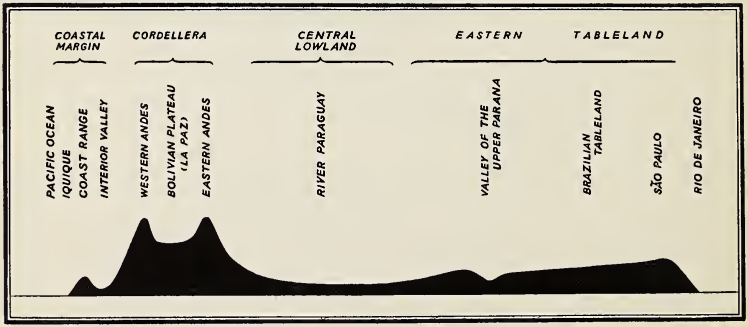

R. Orinoco
Guiana Tableland
Andes
Equator
R. Amazon
Central
Brazil Tableland
Narrow
High Plateau
Coast Lowland
Andes
Lowland
R. Parana
R. Plate

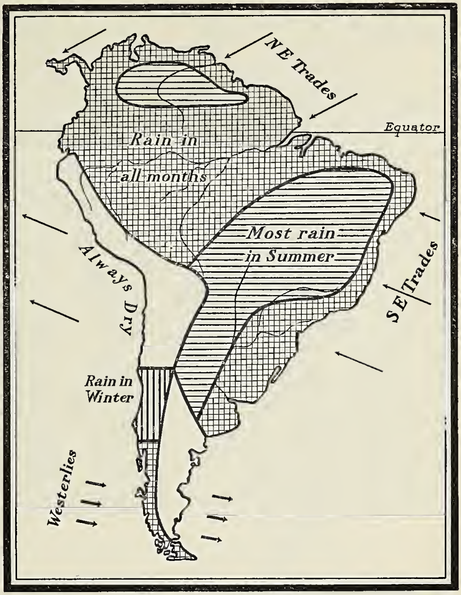
(*Left*)

Surface Divisions of South America, showing the "three highlands, three lowlands, three great rivers." Compare this closely with the map in the atlas.

(*Below*)

Section from West to East across South America. It crosses South America in about latitude 20° S. Compare closely with the map in the atlas, and find the names marked on the section. Heights much exaggerated.

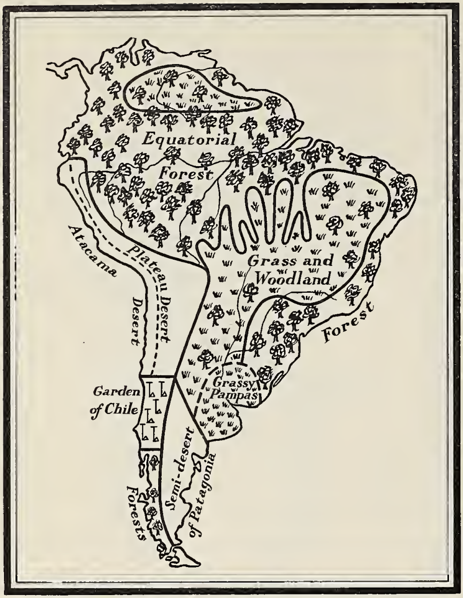

COASTAL MARGIN
CORDELLERA
CENTRAL LOWLAND
EASTERN TABLELAND
PACIFIC OCEAN
IQUIQUE
COAST RANGE
INTERIOR VALLEY
WESTERN ANDES
BOLIVIAN PLATEAU (LA PAZ)
EASTERN ANDES
RIVER PARAGUAY
VALLEY OF THE UPPER PARANA
BRAZILIAN TABLELAND
SÃO PAULO
RIO DE JANEIRO



Rainfall Seasons of South America. Notice that (*a*) the region along the equator has rain in all months and is flanked on north and south by two inland areas which have their rain mostly in the hot months; (*b*) in the trade-wind zone, east coasts have rain in all seasons: the west coast, on the lee side of the Andes, is mostly desert; (*c*) in the latitudes of the westerly winds the exposed west side of the Andes has rain in all seasons, the sheltered east side is dry; (*d*) central Chile, like south-western Australia, has its rain chiefly in winter (May to August), when the westerlies shift northwards following the sun.

The main features of South America are its three highlands, three lowlands, and three great rivers. Along the whole west coast the Andes rise in a vast rampart often a full three miles above the Pacific. They carry the highest volcano, the highest freshwater sea, the highest city, and the highest railway in the world. Their climate varies with the height, passing near the equator from the hot lowlands through a region of moderate warmth to conditions like those in England, and finally to perpetual snows, where only the condor soars. The Guiana and Brazilian tablelands to the east are far lower, but still high enough to enjoy a fairly cool climate.

Bird-Eating Spider.


Equatorial
Forest
Grass and
Woodland
Forest
Atacama
Plateau Desert
Desert
Garden
of Chile
Grassy
Pampas
Semi-desert
of Patagonia
Forests

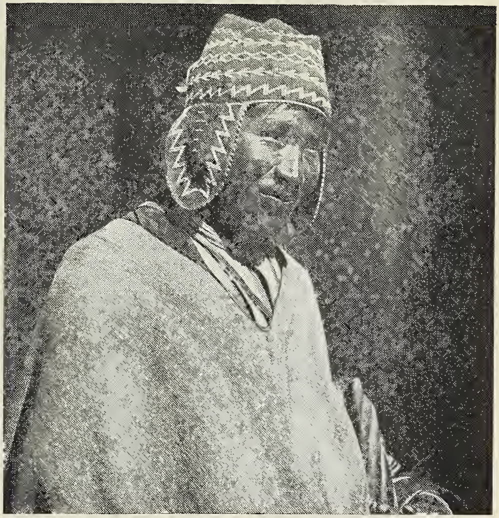
Natural Vegetation of South America. Compare closely with the rainfall map and try to make out what kind of natural vegetation grows in each of the divisions given under (*a*), (*b*), (*c*), (*d*) for the rainfall map.

Between the Andes and the eastern highlands stretches a long broad lowland whose plants change as the rainfall varies. The Amazon lowland is a land of constant rain, covered with dense forest steaming in the equatorial heat. The llanos of the Orinoco to the north and the pampas of the Parana to the south are both lowlands covered in the main with grass; for both have dry seasons in their cooler months, the winter of the northern hemisphere in the one case, and of the southern in the other.

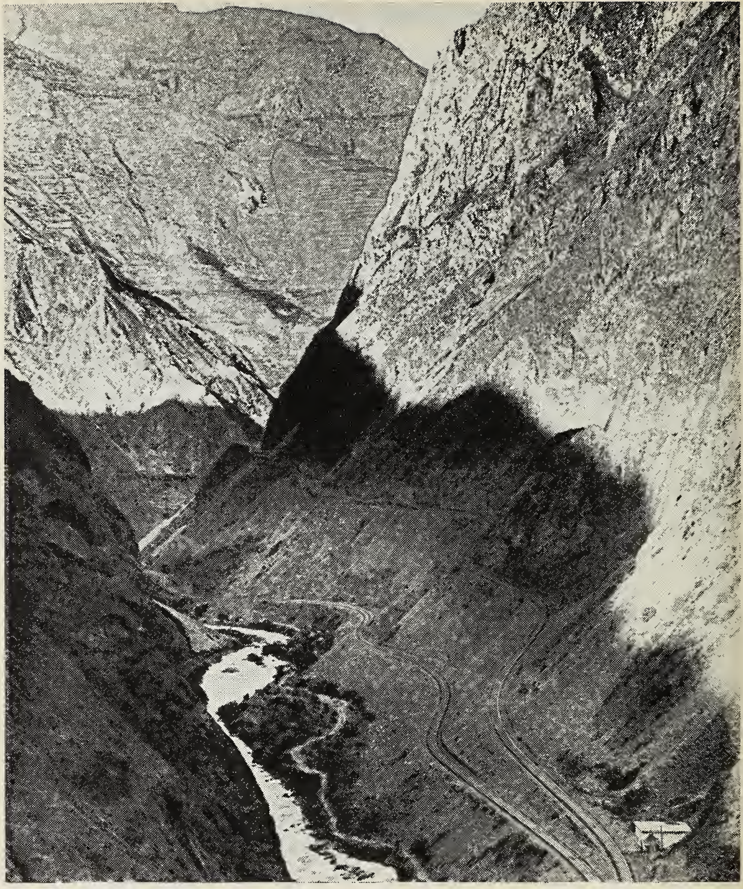
The pampas merge northwards into the Gran Chaco ("Great Chase" or hunting ground), a region of forest, swamp and grassland covering parts of Argentina, Bolivia and Paraguay. It contains tribes of untamed Indians and has much valuable timber, but is still largely unexplored.

The lakes of South America are mainly shallow basins, whose waters extend or contract enormously with the varying

A Mountain Indian. This man comes from the region of Lake Titicaca on the high Bolivian Plateau, 10,000 to 15,000 feet above sea-level. These Indians have very broad chests, for they must breathe the thin air of such heights in large quantities. This man is wearing a poncho or cape, probably of llama hair, and a beaded headdress with long ear flaps to protect him from the cold.



rain supply. Lake Titicaca, between Peru and Bolivia, is both the highest and in parts the deepest. The great rivers are navigable for long distances. Ocean steamers can sail at least 1,000 miles up the Amazon.



The Rimac River Gorge. This river, fed by melting snows on the Andes of Peru, is one of many torrential rivers that flow westward into the Pacific and enable the cultivated area near the coast to be extended by irrigation. In the mountain part of its course the river has cut a deep V-shaped gorge, so deep and narrow that the bottom is in shadow. A rough mule-track winds close to the stream. Above it the railway climbs steeply, but we just can't see the reversing station.

CHAPTER 9

THE STATES OF THE ANDES

TO the early European explorers America seemed a mere obstacle, blocking their westward passage to the riches of the East. But the Spaniards soon took comfort from the spoils of Mexico. When they launched their ships on the Pacific and made the treasures of the Incas their own, Peru became the centre of a New Spain.

The Spanish colonies were founded 400 years ago on a completely different basis from our own far later settlements in Australia or New Zealand. The main object was to transfer the precious metals of the Andes to Europe. The Indians, who had been the serfs of the Incas, remained the serfs of their Spanish conquerors to work the mines or cultivate the vast estates of their masters. The relics of the system are still to be found on the Pacific slopes and valleys of the Andes.

These mountains stretch in two great curves from Venezuela to Bolivia, and from Bolivia to Cape Horn. To cross them has always been difficult; even today few railways succeed in doing so, and then only in the face of great engineering difficulties. In the eight hours' journey through the Rimac gorge there are sixty-five tunnels and sixty-seven viaducts backwards and forwards across the gorge. In places the gradient is so steep that the lines are laid in zig-zags with reversing stations for shunting when two stretches of line join.

The contrast between the two sides of the Andes is very striking. From the equator to 30° S. the mountains block the passage of the trade wind rains.

LLAMA.

The Trans-Andine Railway. The Andes form so high a barrier between west and east that only two railways cross them entirely, the one in Bolivia, the other in Chile. Part of the latter, which joins Valparaiso, in Chile, to Buenos Aires, in Argentina, is shown here. The route has been in use for messengers and pack animals since early Spanish days.

Thus the eastern side is wet and densely forested, while the high plateaus and the western coast are rainless and bare. To the south, however, where the westerlies begin to blow, the western coast is fertile and forest covered, but the eastern side withers to the semi-desert of Patagonia.

The lofty ranges, capped with snow throughout their length, are studded, at intervals, with volcanoes, active or dead. Cotopaxi, the highest active volcano in the world, lies near Quito, the capital of Ecuador. Eruptions and earthquakes have been very frequent and destructive. But the Andes are also a great water-parting. Eastwards the great rivers flow to the

An Indian in his balsa on Lake Titicaca. A balsa is a canoe-shaped boat, made out of bundles of reeds tied together, with upturned ends. The Indian in the picture is punting his canoe along —but many have a mast and a sail of coarse grass. Lake Titicaca, if transferred to England, would reach from London to Cardiff: it is two miles above sea level, the highest freshwater lake of any size in the world.

Atlantic; westwards a series of short torrents rush to the Pacific, watering many a rainless strip as they go.

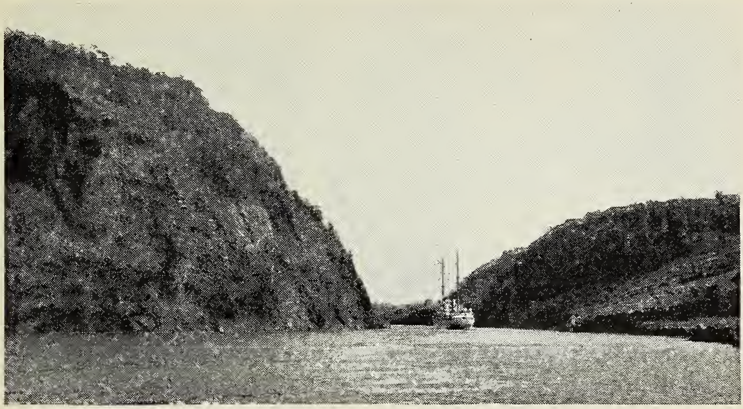
The northern Andes divide into an eastern and a western range, separated by bare, windy plateaus, rich in minerals. Here the Spaniards found the gold and silver they desired: today the mining companies are less romantically engaged in finding copper, tin, and oil. The few railways that reach these regions are wonders of engineering. The line from Lima, the capital of Peru, climbs three miles above sea-level by twists and tunnels and amazing bridges. The trans-Andine railway was opened in 1910. Often the steep climb makes necessary the use of a cog wheel on the engine working in a rack between the rails, and the

Antofagasta, Chile. Antofagasta is a town of 50,000 inhabitants. All food, clothing, building material and other domestic supplies have to be imported. Water is brought by pipe-line from 200 miles away.

trains have to be short ones. Three thousand feet below the summit a tunnel two miles long avoids the last steep climbs. The upper sections of the line are often blocked by deep snow.

The countries here lie right across the Andes, so that each is divided into three parts: the coast-slopes, the mountain plateaus, and the eastern slopes. Real union between the parts is hampered by the mountain barriers; all these countries are backward and many parts are still unexplored.

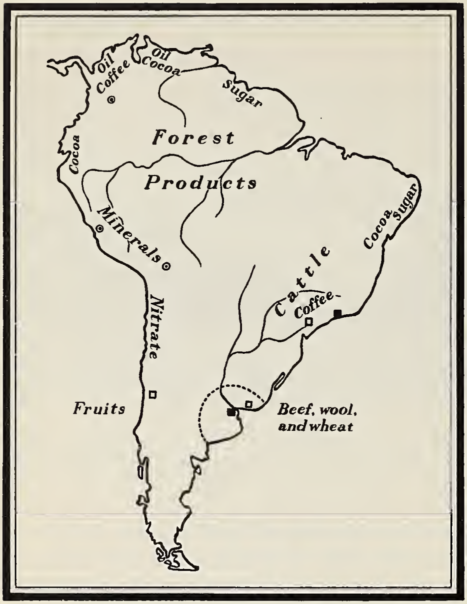
The long, narrow territory of Chile lies between the Andes and the sea. This has made union easier in spite of a length of nearly 3,000 miles, and accounts in part for Chile's more rapid progress. Here again we find three divisions, but this time they lie lengthways. The northern desert was till recently the main source of wealth; for from it were dug the nitrates that older countries needed to fertilise their soils. The nitrates were exported from Antofagasta, which is also a port for the trade with the high plateau in Bolivia. Like other north Chilian



The Panama Canal. This is one of the few deep cuttings. The Canal is forty-two miles long, and might be described as an artificial lake, eighty-five feet above sea-level, formed by damming the river Chagres. The sea is reached by three locks at each end.

ports, it lies on an unprotected roadstead and is shut out from the interior by a band of mountains. These are barren because no rain falls. Only here and there are there gaps through this barrier. But now we have learnt to extract our nitrates from the air. The discovery will compel Chile to develop the resources of her second section, the central valley. This, like southern Australia, is sure of rain when the westerlies move northwards in winter. It is a region of wheat-fields, vineyards and gardens, and in it lies the capital, Santiago, and the port of Valparaiso, the terminus of the trans-Andine railway. The third section is really a sunken extension of this valley into the channels, cliffs and islands of the south. Its wetter climate produces thick forests, but they are of little value.

To the states of western South America the Panama Canal,

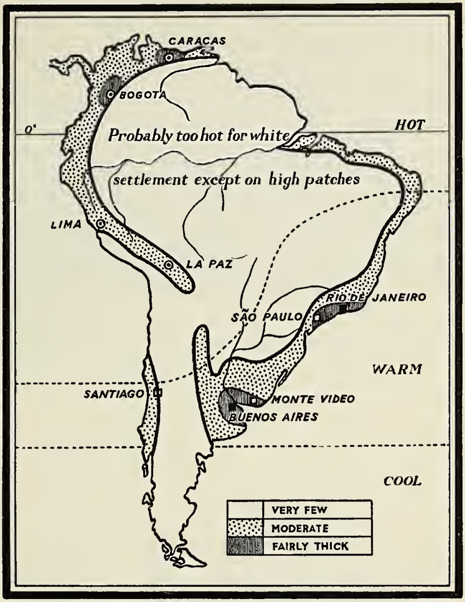

Oil
Coffee
Oil
Cocoa
Sugar
Forest
Cocoa
Products
Minerals
Cocoa
Sugar
Cattle
Coffee
Nitrate
Fruits
Beef, wool, and wheat

Some Products of South America, showing the principal products which are exported and the regions from which they are obtained.

built by the United States just before the Great War, is a godsend. It shortens their sea routes to Atlantic ports by distances varying from 1,000 to 9,000 miles. The canal was cut at Panama because the isthmus is narrowest there, and the mountain backbone lowest.

But the more central states would like to have the use of the eastern rivers. Bolivia, for example, has no sea-coast of her own, though railways connect the capital, La Paz, with both oceans. She hopes for outlets by both the Amazon and the Parana. Venezuela and Colombia are more fortunately placed, for they have seacoasts on the Atlantic side.

Most of the land is held by the old families of Spanish descent. Trade and mining rights are largely in the hands of foreigners. The natives, Indian or half-breed, work in the mines, tend the crops and herds of their masters, or drive the llamas that carry burdens over the rough mountain tracks. Some breed a few sheep and llamas for a scanty living.

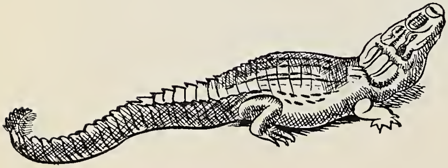

CARACAS
BOGOTA
0°
HOT
Probably too hot for white
settlement except on high patches
LIMA
LA PAZ
SÃO PAULO
RIO DE JANEIRO
WARM
SANTIAGO
MONTE VIDEO
BUENOS AIRES
COOL
VERY FEW
MODERATE
FAIRLY THICK

Chief Settled Areas of South America.

South America has little more than a rim of settlement, 100-200 miles wide, round the coast. Even this is not continuous all the way round but is broken into three strips: (*a*) along the east coast from the mouth of the Amazon to the Plate River is mostly in the Warm Belt; (*b*) in central Chile, with its good winter rains, is also in the Warm Belt; (*c*) in the north-west is in the Hot Belt, but high up on the cool Andes. Only over the pampas of Argentina does settlement penetrate far inland. The greater part of the interior is peopled by a few Indians, as wild as when the Spaniards first arrived 400 years ago.

Fuller use of the soil is needed to bring real and lasting prosperity. For want of railways the fertile eastern slopes are almost untouched. The mines, which remove wealth that can never be replaced, are no substitute for crops, especially when their profits go into foreign pockets. It is a hundred years since these republics became independent of Spain, but the use they make of their resources has scarcely altered.

In the states of the Andes within the Hot Belt four out of the five capitals are high up in the mountains. Caracas, the capital of Venezuela, is 3,000 feet above the Caribbean Sea—only eight miles in a direct line, but twenty-three miles by the zig-zags of the railway. Bogota, the capital of Colombia, lies in a high basin, 8,000 feet above the sea, surrounded by still higher mountains. Similarly Quito, the capital of Ecuador, is 9,000 feet, and La Paz, the capital of Bolivia, is 12,000 feet above the Pacific. Only Lima, the old colonial capital of the Spanish Empire in South America and the present capital of Peru, lies low down on the coastal plain six miles from its port on the Pacific Ocean. It is surrounded by irrigated fields of tropical crops such as sugar, cocoa and cotton.



CAIMAN.

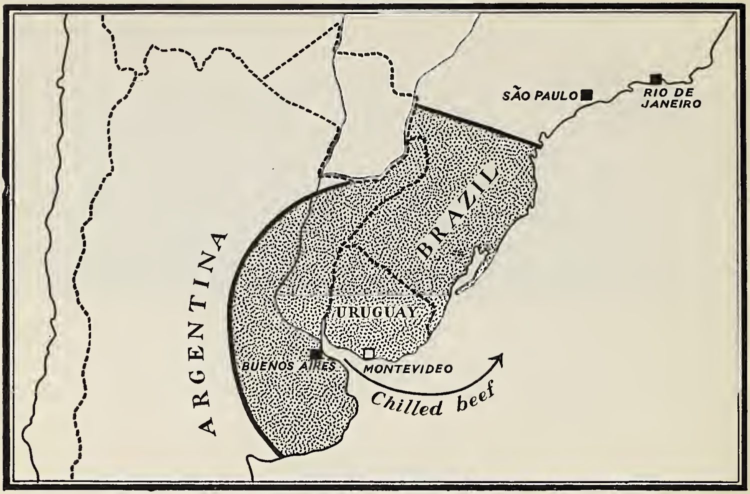
The Argentine Pampas. Note the flat, treeless nature of these grasslands. The few trees have been planted by the owner of the estancia as a shelter from the sun or cold southerly winds. The " gauchos " seen in the picture are the cowboys of the pampas, swarthy half-breeds of Spanish and Indian descent. They are expert riders and cattlemen.

CHAPTER 10

EAST OF THE ANDES

THE two chief eastern states, Brazil and Argentina, cover more than half the continent. Brazil, indeed, is three times the size of Argentina, but in trade it is the other way about, for Argentina has the better climate and fewer difficulties of transport. Let us, therefore, begin with Argentina.

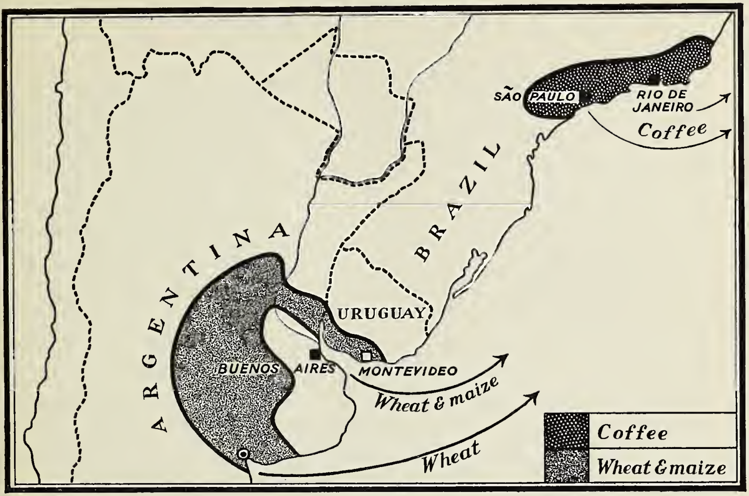
Buenos Aires, the town of " good airs," the present capital, was founded by Spaniards in 1535, but only as an outpost of Peru. Today it is a city laid out on the American chessboard pattern, with many open spaces, and contains nearly a fifth of the country's ten million inhabitants. Trade by way of the Rio de la Plata (River Plate) was forbidden lest the Government of Lima should lose its profits. It was 200 years before Argentina began a history of her own.



Cattle. The warm, moist grasslands round the estuary of the River Plate suit them best. As shown by the arrow, Buenos Aires is the chief port for sending out chilled beef; most of it comes to Great Britain.

La Plata and Argentina both mean "silver," but it existed only in the dreams of the explorers. The pampas contain no metals. They cover what was once a great delta and extend for 300 miles round Buenos Aires in level plains of coarse, tussocky grass. Nothing breaks the horizon but the scattered estancias with their steel wind-pumps and wire fences. All timber comes from the forests further north. A few trees at most have been planted round the homesteads for shade or for protection from the "pampero," the cold south-west wind from the Andes.

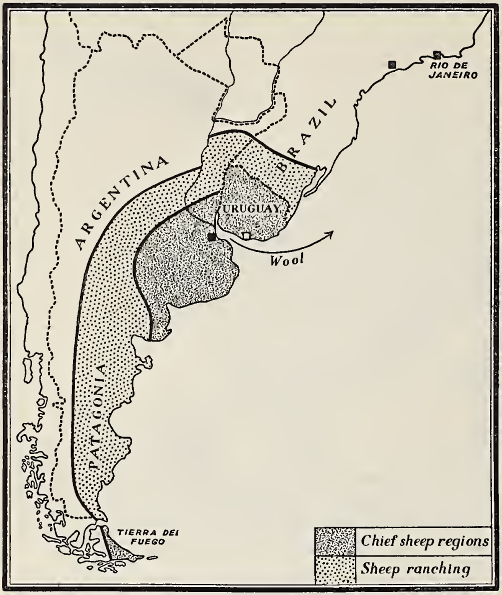
On these sunny, open plains the Spaniards bred cattle and sheep. They worked their vast ranches with the help of gauchos, selling at first only the hides and wool. Modern


SÃO PAULO
RIO DE JANEIRO
Coffee
BRAZIL
ARGENTINA
URUGUAY
BUENOS AIRES
MONTEVIDEO
Wheat & maize
Wheat
Coffee
Wheat & maize

Wheat and Maize. The chief area for these grain crops is much the same as for cattle. They are much less frequent on the coast-lands of Argentina, owing partly to heavier rainfall and partly to competition from cattle and dairying.

inventions and the sowing of alfalfa, or lucerne, a kind of clover, have changed their methods. Beef in all its forms, chilled, frozen or tinned, is exported in great quantities. The short sea passage to Europe gives Argentina a great advantage over Australia, for chilled meat, which is better than the fully frozen, will only keep six weeks. The sheep are spreading from the pampas to the drier, colder region of Patagonia.

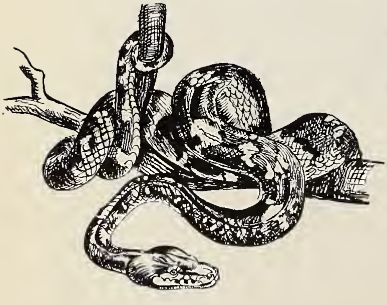
With the growth of railways, so easy to build on the plains, wheat has claimed an increasing share of the pampas, and small farmers, mostly from Spain and Italy, have entered the cattle country. Land is readily obtained, but labour is scarce, so here again the tractor and the "harvest-combine" do the work of



Sheep. It will be noticed that sheep are reared in the same area as cattle, but sheep-ranching extends further west into the drier interior and further south into the colder, rougher land of Patagonia and Tierra del Fuego.

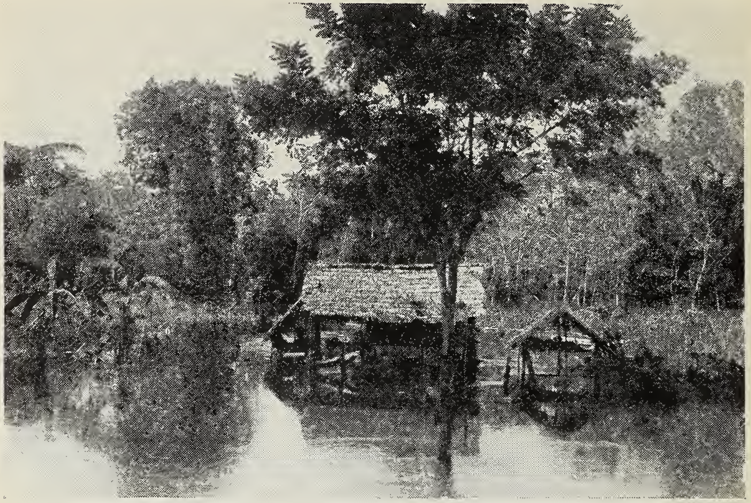
many men. Argentina grows more wheat than Australia and New Zealand together. But farmers and stockmen alike have an enemy as destructive, at times, as the Australian rabbit, though in this case it is a native. Swarms of locusts sometimes settle on the pampas, eating every blade of grass or corn and ruining whole districts.

On her wooded north-eastern frontier Argentina meets Brazil. So, in fact, does every other state except Chile and Ecuador, for Brazil is nearly as big as Europe. Through the unknown interior wander Indian tribes of whom little is known. North Brazil is impenetrable forest with a few settlements only on the river-banks. Further south cooler open highlands stretch towards a narrow coast plain. Nine-tenths of the civilised population



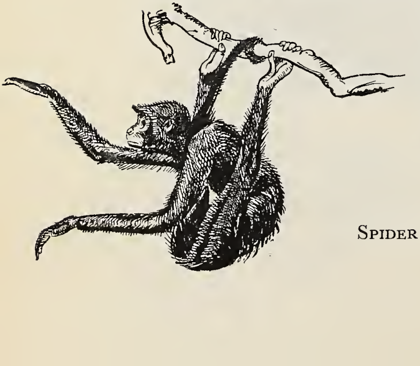
Tree-boa.

A Coffee Tree. The coffee bean of the shops is the seed of a shrub. When gathered, the soft outer pulp is removed by machinery, and the berries are laid out in the sun for a week to dry. They are then packed in bags and sent by rail down to the ports of Santos, which deals with half the crop, and Rio de Janeiro. Most of it goes to the United States.

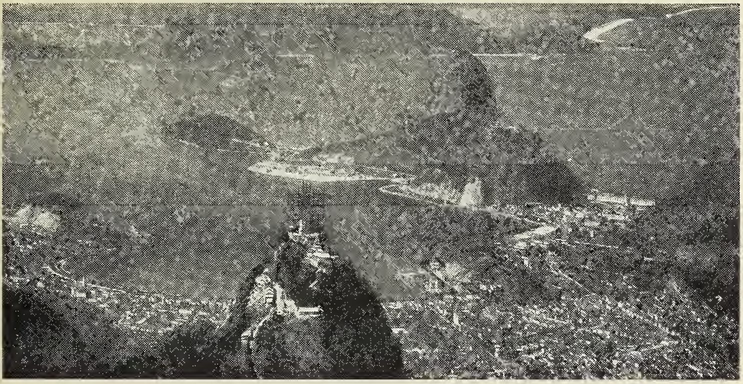


Scene on the Amazon. The rectangular hut is built on piles in the water for protection against enemies, beast or man. The ends and sides are open because of the great heat; the roof slopes from a ridge pole and is closely thatched with leaves and grasses against the heavy rains.

are collected in this area, where the hills produce Brazil's chief source of wealth, her coffee crop. Her prosperity depends on this one product, and when she cannot sell it she suffers severely (map, p. 79). The coffee plant was brought to Brazil from Arabia 200 years ago. Left to itself it grows 20 feet high, but for picking purposes it is trimmed to no more than eight. The berries or "cherries" grow in bright red clusters about the stems of the shoots, and it is the two seeds of these berries that are dried to make coffee when roasted and ground. The plant grows best on hill-sides in a particular red soil



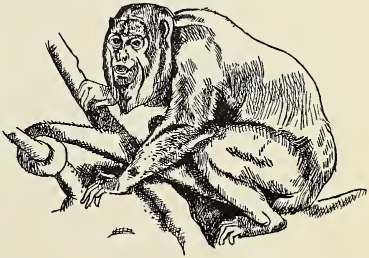
Spider Monkey.



Rio de Janeiro has a magnificent setting. The view, looking north, shows the entrance to the land-locked bay, with the Atlantic on the right. Two pinnacles of rock overlook the view. The one near the centre of the picture is the Sugar Loaf; the jagged peak near the bottom of the picture rises over 2,000 feet from amid the houses of the city.

for which the Sao (*San*) Paulo region of Brazil is famous. It needs much rain and good drainage, and must never be exposed to frost.

In the sweltering selvas of the Amazon a fierce though silent struggle rages. Countless trees and plants are competing for every inch of ground, striving to lift their heads above their neighbours' to get a place in the sun. The weaker start on the branches of the stronger, shortening the journey to the light above, while creepers mount from bough to bough to flower among the tree-tops. Beneath the evergreen canopy of leaves the gloom is intense. Giant stems festooned with mosses and twining climbers lose themselves in the tangle above, and ferns and other plants that have learnt to live in

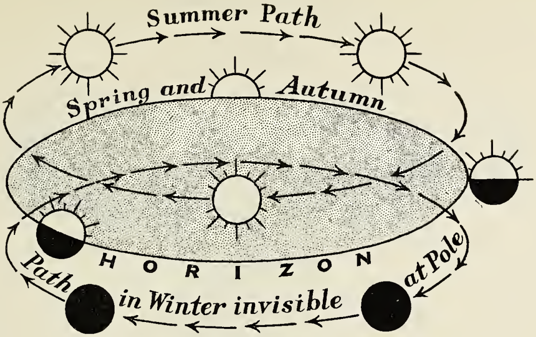


Howler Monkey.

darkness block the path below. The ground is covered with rotting trunks, and a damp heat heavy with the odour of strange flowers and mouldering wood makes all progress a weary effort. This is the equatorial forest, the home of the rubber-tree and many valuable kinds of timber.

Animal life is abundant in the forest. Some creatures, like the sloth, never leave the trees, and others, like the jaguar, spend most of their lives in them. There are many kinds of monkeys, some with tails that grasp the boughs, some that howl all night long. Great boa-constrictors pursue their prey among the branches: toucans and humming-birds and bird-eating spiders haunt the forest depths, caimans and manatis the rivers. But human food is found chiefly in the clearings by the river banks, and there the Indians live.

It was the Portuguese and not the Spaniards who colonised Brazil. They introduced negro slaves and converted many of the Indians to Christianity. The northern Brazilians of today are often a mixture of the three races. Further south, colonists mainly from Mediterranean countries help to keep the population white. Rio de Janeiro, the capital, is a modern city built on an enclosed harbour. Its great rival is São Paulo, the centre of the coffee districts. Both contain over a million inhabitants.



The Sun's Path as seen from the North Pole.

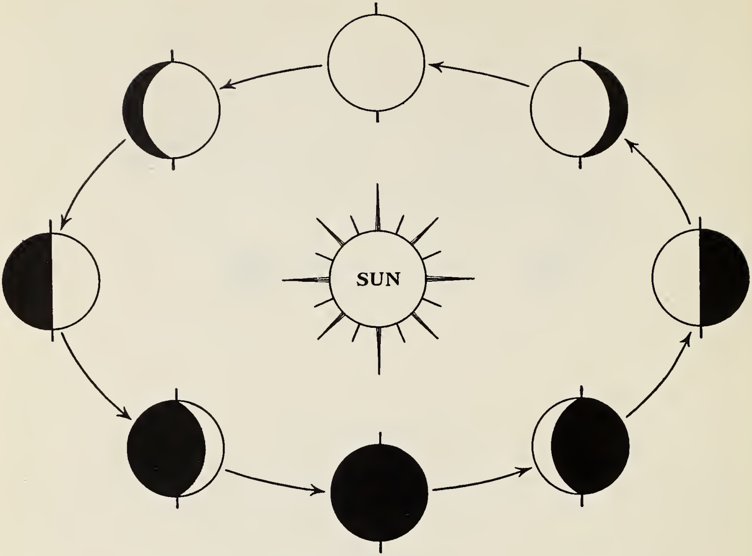
CHAPTER 11

THE SEASONS

IF you start a top spinning the opposite way to the movement of the hands of a clock and then whip it hard from the left, you will see something like the motions of the earth in space. The spin of the top will be in the same direction as the spin of the earth, and the wide circles that it makes over the floor when you whip it will roughly show the way the earth travels round the sun. But only roughly, for the earth requires no whipping. Regularly every twenty-four hours it spins once round its axis, and regularly in the course of every twelve months it makes one passage round the sun.

Now let us imagine ourselves no longer on the surface of the earth but floating somewhere out in space and watching its movements as spectators only.

The first thing we notice is that half the earth, but not, of course, the same half, is always in the sunlight and half in shadow. Looking closer, we see that the earth is not upright. It

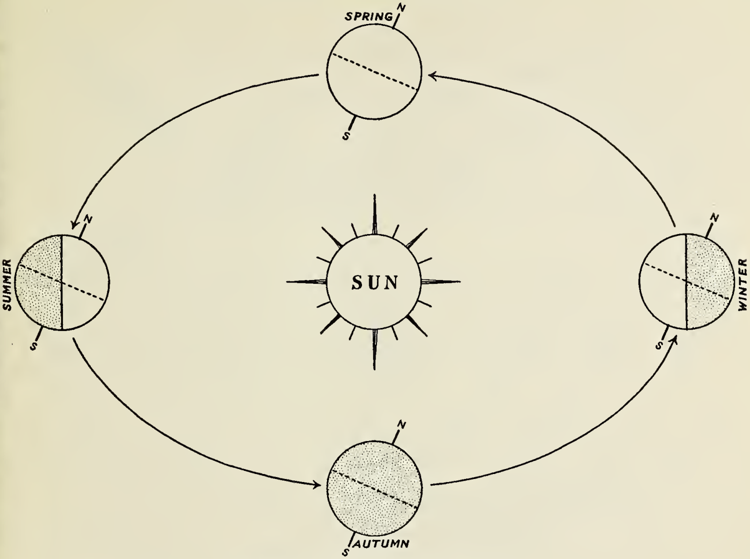


The Upright Earth.

spins with its axis tilted over about a quarter of a right angle. This odd behaviour has very important results. Let us see what would happen if the earth were upright.

We are watching its movements from one side, and we see that the north and south poles would *always* be just on the border-line between light and darkness. As the earth spun round, therefore, every place on the earth would spend as long in darkness as in light. Since no place could get round into the light again more quickly or more slowly than any other, each twenty-four hours would be divided everywhere and always into a twelve-hour day and a twelve-hour night.

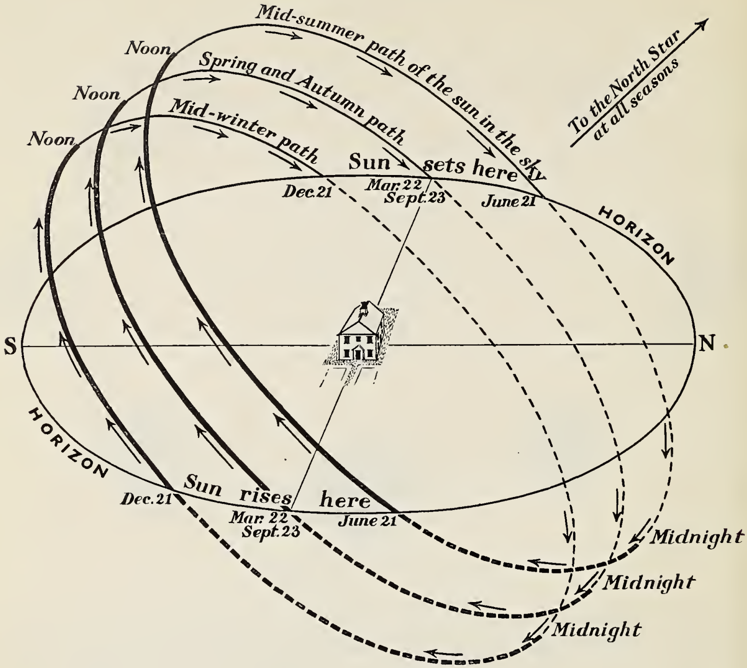
But even more important would be the fact that every



The Earth's Path round the Sun.

place would always receive the same amount of heat from the sun—the equator a great deal, and places in other latitudes less and less, till the two poles got hardly any. In England, for instance, we should have spring weather all the year round, and there would be no change of seasons anywhere on the earth.

And now from our place in space we must watch the earth again. When a top circles round the floor it leans inwards all the time. If the earth did the same, England would always enjoy summer warmth, but there would still be no change of seasons, and the regions near the south pole would get no heat at all, for they would turn in constant darkness. But in fact the axis of the earth does not lean inwards all the


Mid-summer path of the sun in the sky
Noon
Spring and Autumn path
Noon
Mid-winter path
Noon
To the North Star at all seasons
Sun sets here
Dec.21
Mar. 22
Sept. 23
June 21
HORIZON
S
N
HORIZON
Sun rises here
Dec.21
Mar. 22
Sept. 23
June 21
Midnight
Midnight
Midnight

time like the top but always points the same way, so that the northern end of the axis which in June points to the sun, points away from it in December, as the figure on page 87 shows; this gives every part of its surface in turn a chance of seeing the sun.

Let us now examine four positions of the earth at intervals of three months and see how different parts of the globe are affected by the changes.

In June, or the northern summer position, the north pole is tilted over towards the sun, bringing the whole northern hemisphere more directly underneath it and turning the southern away from it. Day in the north is long, and night is short. Anyone near the north pole would be in the light all the twenty-four hours, but the daytime would gradually get less if he moved south, until at the equator day and night would be equal. In the southern hemisphere the daylight hours would decrease from twelve at the equator to none near the south pole.

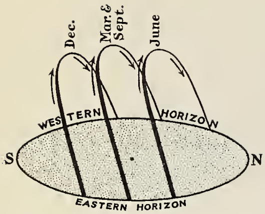
In December, or the northern winter position, the north pole is tilted away from the sun, the south pole towards it. If you put December for June, north for south and south for north throughout the last paragraph, you will be exactly describing the December position.

But in the other two positions, which the earth reaches in March and September—that is, in our spring and autumn—the earth lies sideways to the sun, since it is tilted in the same direction still. The line of light and darkness passes directly over the poles, which are therefore in twilight. Neither hemisphere is turned towards or away from the sun, and day and night are equal everywhere. These facts are much easier to understand if you place a globe in the corresponding positions round some light which represents the sun.

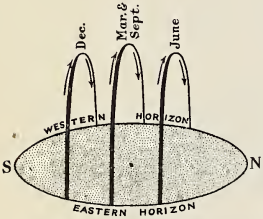
And now we must return to the earth again and see how these changes appear to us at home. Let us suppose that we have built a house somewhere in England where we can see the horizon all round and watch the sun from our windows.

We shall see it rise late and far to the south-east in December, cross the sky at a low angle, and set early in the south-west. In March it will rise due east at 6 o'clock, pass higher across the sky, and set due west at 6 o'clock in the evening. In June it will rise very early far to the north-east, climb high at noon, though still well south of our house, and set behind the house again late in the evening a long way north of west. Then it will begin to go back again, reaching its March path in September and returning in December to where it was twelve months before. And so with these changes in the amount of light and heat we receive from the sun our seasons change as well.

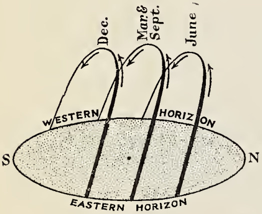
At no time, as the figure on page 88 shows, is the sun directly over our heads in these islands. For that to happen we must be much nearer the equator. It happens in June at lat. 23½° N. and in December at lat. 23½° S. Having reached these extreme points the sun seems to retreat, passing from one to the other across the equator and back again every year. Hence these latitudes are called the tropics, or "turning-places" of the sun, the Tropic of Cancer being the northern turning-place, the Tropic of Capricorn the southern. Between these tropics seasons like ours do not occur. The most that happens is a change from drought to rain and rain to drought. But the rain, strangely enough, comes when the midday sun stands overhead or nearly so, for the heat causes violent thunderstorms.


Dec.
Mar.& Sept.
June
WESTERN HORIZON
S
N
EASTERN HORIZON

Sun's path as seen on the Tropic of Cancer.


Dec.
Mar.& Sept.
June
WESTERN HORIZON
S
N
EASTERN HORIZON

Sun's path as seen at the Equator.


Dec.
Mar.& Sept.
June
WESTERN HORIZON
S
N
EASTERN HORIZON

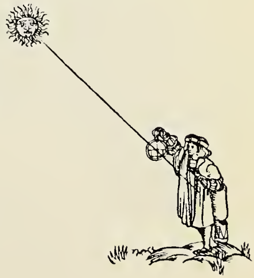
Sun's path as seen on the Tropic of Capricorn.

The Cape of Good Hope. From Table Mountain, which towers over Capetown, there runs for thirty miles southward a table-topped line of heights ending in the cliffs of the Cape of Good Hope. (See diagram, p. 121.)

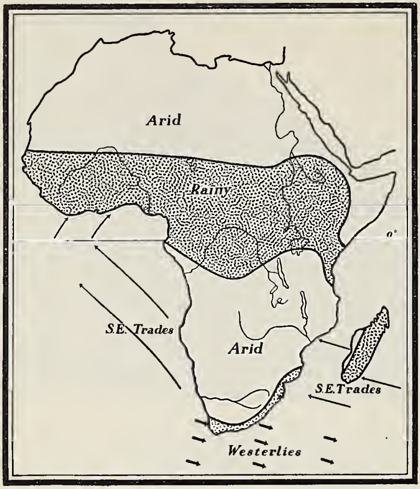
CHAPTER 12

AFRICA: THE TROPICAL CONTINENT

THE man to whom we owe the great geographical discoveries was Prince Henry of Portugal, surnamed the Navigator. At the extreme south-west point of Europe, looking out to the unknown, he founded a school of seamanship and supplied it with the best maps and books and instruments the fifteenth century could produce. Here men learnt to laugh at tales of terrible sea monsters and the Atlantic ocean boiling under the equatorial sun, or of Satan's arm upraised above the waters to drag the reckless mariner to his doom. By slow degrees



Using an Old Sextant to Find the Height of the Sun.



Rainy Regions of Africa—July.

The noon sun is vertically overhead north of the equator; the broad band of rain has followed it and lies between latitude 5° S. and 20° N.

All North Africa is dry.

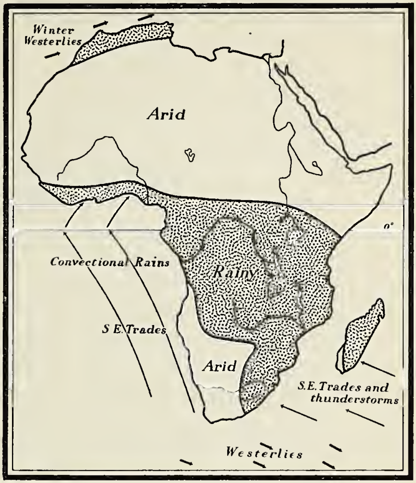
The east coast facing the trade winds is wet in all seasons, except where sheltered by Madagascar.

The westerlies have shifted to their northernmost limit and give rain to the south-west near Capetown.

Prince Henry's captains crept past the waterless fringe of the Sahara down to the "Green Cape" of Africa, Cape Verde, and its islands, and round the corner to the country of the "blackamoors." After his day, but inspired by his teaching, the great discoverers arose, Columbus, Vasco da Gama, Magellan, and the rest.

Just as America at first seemed merely a barrier between the early Spanish explorers and the riches of the East, so the coasts of Africa round which Vasco da Gama led the Portuguese were hardly more welcome. They lengthened seriously the route to the East. The Portuguese never found a use for the country round the "Cape of Storms" (the later Cape of Good Hope). With West Africa, however, it turned out otherwise, as we shall see.

Africa lies almost exactly between 35° N. and 35° S., so that the equator crosses it in the middle. This brings the continent as a whole much further north than South America, whose eastern



Rainy Regions of Africa—January.

Here it is summer in the southern hemisphere. The noon sun is vertically overhead south of the equator. The belts of rain have shifted southward after it. The rainy band along the equator lies between 10° N. and 10° S.

The northern westerlies and their rains cover North-West Africa.

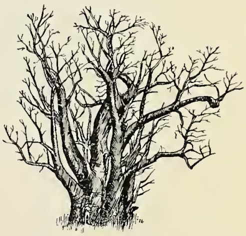
The east coast is again rainy.

The southern westerlies have shifted southwards and South-West Africa, near Capetown, is dry and sunny.

shoulder seems intended to dovetail into the Gulf of Guinea.

Balanced so evenly across the equator, Africa is hotter, as a whole, than South America. Only the extreme north and south reach even as far from the Equator as the Warm Belt; all the rest is in the Hot Belt, though a few parts are high enough to enjoy a moderate climate.

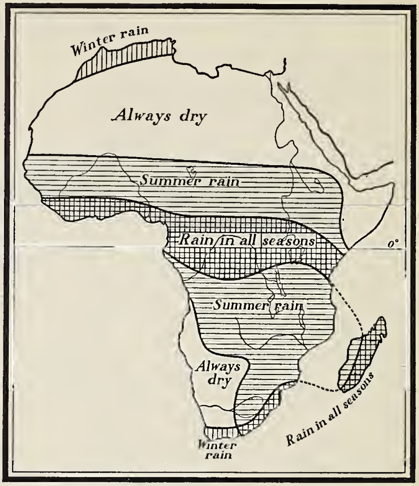
Twice a year the sun in its yearly course stands directly overhead at all places between its turning-points, the Tropics of Cancer and Capricorn. This occurs, once on its northern journey between December and June, and again as it passes south between June and December. Wherever the sun goes, the tropical rains follow it; and since the midday sun is never far from being directly overhead at any place within ten degrees of the equator, the Congo Basin, like the Basin of the Amazon, is drenched with rain in most months of the year. So here



Baobab Tree.

again, as by the Amazon, trees in astonishing numbers cover the ground, shutting out the daylight for miles together.

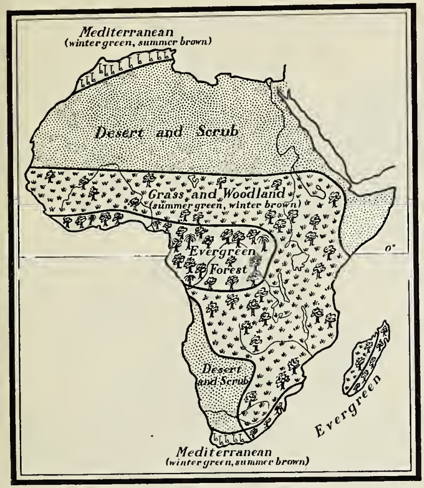
On either side of this equatorial forest, across the Sudan and across Rhodesia, lie regions of summer rains corresponding to the visits of the sun. As the rainfall becomes less, the equatorial forest opens out by slow degrees into open woodland, park-like, with plenty of grass. Savanna is the name for such tropical grassland in Africa. The chief change is from rain to drought, from vigorous plant life to withered vegetation.



Rainfall Seasons of Africa. This map combines into one the facts shown in the January and July maps, and divides Africa into its belts of rainfall by seasons.

Beyond these regions the rains grow shorter and scantier, until the summer green of the grasslands fades into the unchanging brown of the Sahara in the north, and the Kalahari Desert in the south. But to the south-east coast, as in Australia and Brazil, the south-east trades bring plenty of rain. In the north, the north-east trades, blowing out from Asia, have no rain to bring, and the desert there extends eastward to the Red Sea and beyond.

As in Australia and South America, the natural vegetation depends very largely on the rainfall. Compare this map with the vegetation maps of those countries. Notice how rain at all


Mediterranean
(winter green, summer brown)
Desert and Scrub
Grass and Woodland
(summer green, winter brown)
Evergreen Forest
0°
Desert and Scrub
Evergreen
Mediterranean
(winter green, summer brown)

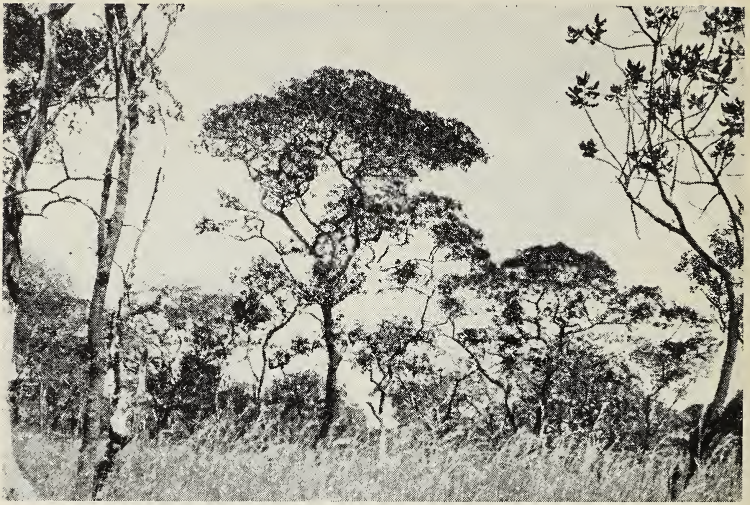
Natural Vegetation.

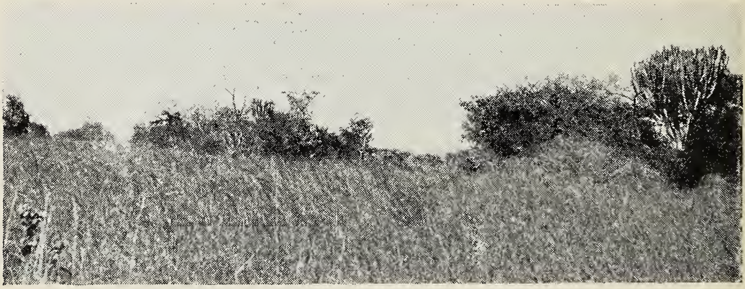
seasons produces forests, rain only in the summer produces grass and woodland, rain at no season means desert. The regions of winter rain and summer drought have dry shrubby plants like heaths.

In the extreme north-west and south-west, in the Atlas region and round Capetown, rains brought by the shifting westerlies fall in winter, as in Southern Australia and Central Chile.

The various climates of Africa are thus arranged in pairs north and south of the equator. But from one to the next there is no sudden change, such as the Andes cause in South America. Except the Atlas ranges, Africa has no long mountain barriers. Its surface consists of a series of platforms of varying height. From the Red Sea to a point south of the Congo mouth, a curving line divides the lower platforms of West Africa from the higher regions of the east and south.

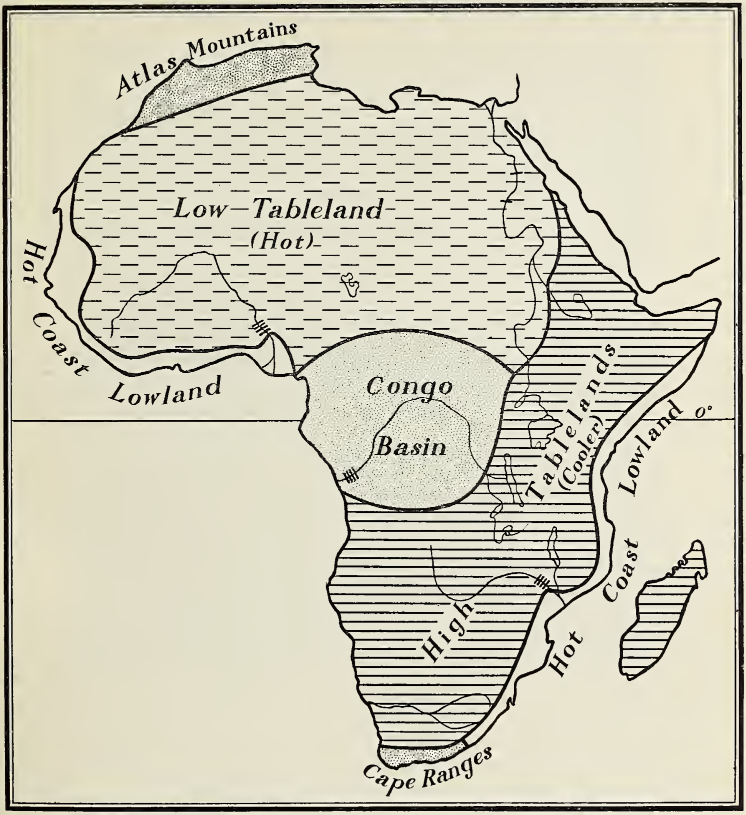
Africa has little lowland. Thus the greater part of the continent consists of the low, hot tableland (about 1,000-1,500 feet above sea level) of the north, and the high, cooler tableland of the east and south. Between the two is the Congo Basin, a " saucer " about 1,000 feet above the sea: the saucer gathers tributaries to the Congo from all sides and then cuts through





Savanna (1). The photograph above shows that the trees are spaced out and scattered, their crowns do not touch each other as in the true forest, and the small leaves grow in tufts. Since sun and air can get through, the ground is carpeted with a rich growth of tall grasses.

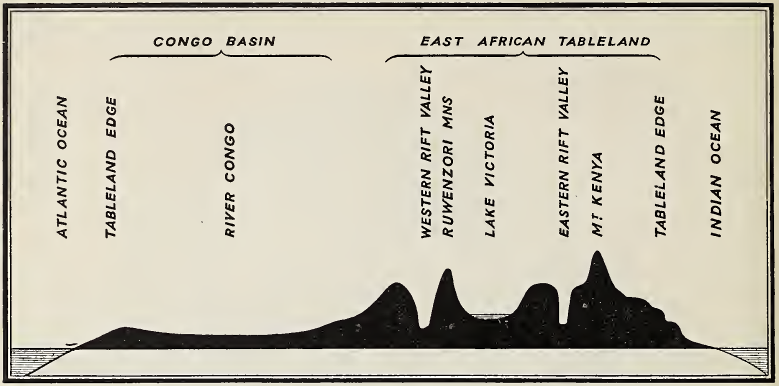
Savanna (2). Still further north and south, as the rainfall becomes scantier, trees become less frequent and the grass occupies more space. While the scene in the first photograph is more like woodland, this is clearly a grassland.


Atlas Mountains
Low Tableland
(Hot)
Hot Coast
Lowland
Congo
Basin
Tablelands
(Cooler)
High
Lowland
Coast
Hot
0°
Cape Ranges

Surface Divisions of Africa.

the western rim and tumbles down to the Atlantic Ocean over 100 miles of rapids.

In the section across Africa the heights are again much exaggerated. Africa is 2,300 miles wide when measured along

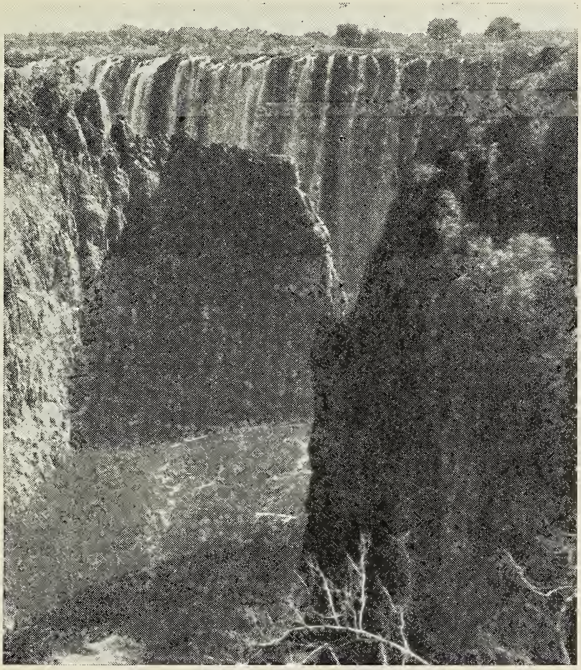

CONGO BASIN
EAST AFRICAN TABLELAND
ATLANTIC OCEAN
TABLELAND EDGE
RIVER CONGO
WESTERN RIFT VALLEY
RUWENZORI MNS
LAKE VICTORIA
EASTERN RIFT VALLEY
MT KENYA
TABLELAND EDGE
INDIAN OCEAN

Section from West to East across Africa along the equator. Compare with the physical map of Africa in the atlas.

the equator, but her highest point is only three miles above sea level. The section shows the two steep edges of the tableland, the Congo " Saucer " and the very much broken tableland of East Africa (described more fully in Chapter XVI.).

Africa's four great rivers, the Nile, the Niger, the Congo and the Zambezi, cannot be navigated, like the Amazon or the Parana, by sea-going ships. Their great curves on the tablelands of the interior are often navigable for long distances, but sooner or later they plunge over the edge in some impassable waterfall.

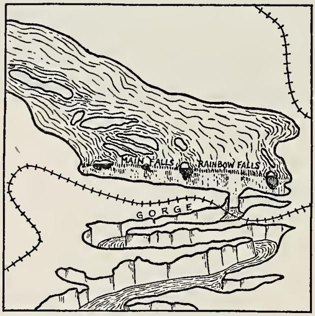
The Zambezi flows on the African tableland in the shape of a sickle, and is divided by falls and rapids into three parts. Forty miles above its mouth the river is sawing down the edge of the tableland, and some 800 miles higher up it pours down the Victoria Falls, which are twice the height of Niagara. At the lip of the Falls the Zambezi is a mile wide. The water plunges 250 feet down into a narrow chasm. The mass of



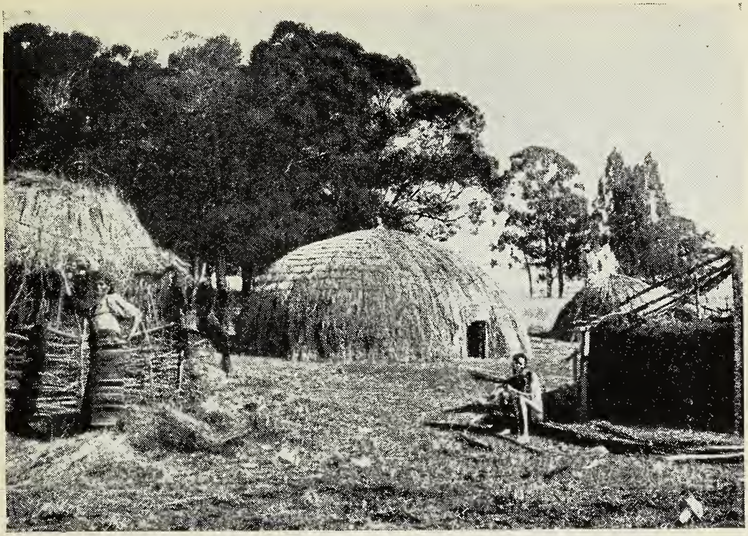
The Victoria Falls. On calm days in the rainy season, when the volume of water is greatest, five columns of spray, the " Five Fingers," rise to great heights that can be seen twenty-five miles away. To the natives the Falls are " the smoke that thunders." To the spray is due a belt of rain-forest on the down-stream side of the chasm, and mackintoshes are needed by those who go close to view the scene.

green water and white foam battles its way for miles between the black cliffs of a zigzag gorge. Thereafter the gorge straightens for another thirty miles.

The Livingstone Rapids on the Lower Congo are foaming cataracts a hundred miles in length. Round these obstacles railways have now been built, but for many years the entry of Europeans to the interior was delayed because it was impossible to sail up the rivers.



Victoria Falls and Gorge.



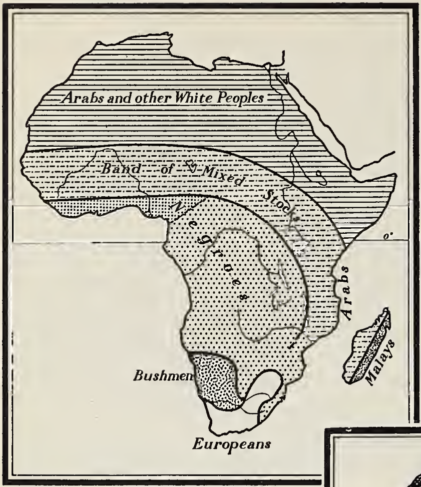
Native Scene in South Africa. Negro features here are modified. The colour is chocolate rather than black. The hair is less curly, the nose less broad and the lips less thick. The huts are shaped like an upturned bowl. Pliant sticks are bent and tied at the top to form a framework. The frame is then thatched with reeds or grasses and tied down.

CHAPTER 13

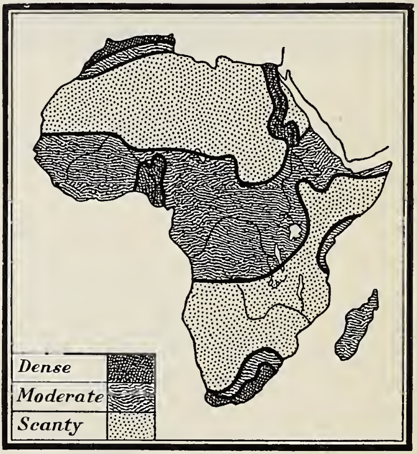
THE AFRICANS

THE Sahara is the northern frontier of the dark-skinned African peoples. There and to the east the negroes have intermarried with their lighter-coloured conquerors, and we find less of the coal-black colour, the broad, flat nose and thick lips of the typical African.

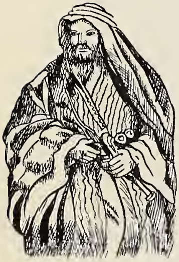
In build, intelligence and manner of life the Africans vary


Arabs and other White Peoples
Band of Mixed Stock
Negroes
0°
Arabs
Malays
Bushmen
Europeans

Races of Africa. North Africa is peopled by white races akin to those of Europe—*e.g.*, Egyptians and Arabs. The southern half of Africa is the home of the negroes. These include two big divisions—the dark West Africans, like those of Southern Nigeria, and the Bantus. South Africa has been colonised by Dutch and British. The Arabs of the East Coast came to get slaves, ivory and spices.


Dense
Moderate
Scanty

Distribution of Population in Africa. For its size Africa has not a large population, a total of 150 millions as compared with Europe's 550 millions. Large areas in the north and south are scantily peopled; there are four patches, especially the Lower Nile Valley, where the density is above the average.



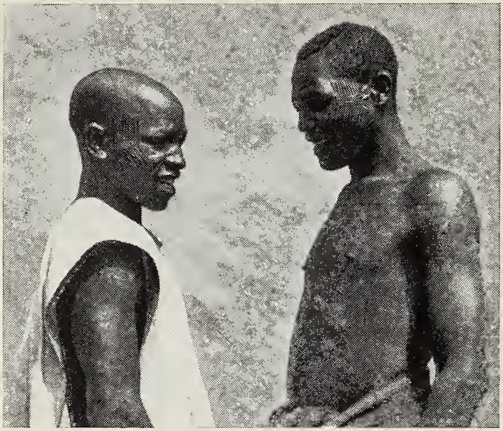
Arab Trader.

A Negro Woman of Southern Nigeria. Her features are those of a West African negro. Her lips are thick and turned outwards. Her nose is broad and flat; her skin black and her hair woolly.

with the kind of country they inhabit. The lowest type are the little Bushmen of the Kalahari Desert. It takes all their energy to get a bare living. Water is scarce, but enough grass grows to feed a surprising number of antelopes and other game. These the Bushmen must kill or starve, and they are clever trackers, stalking their prey in the skins of animals. In this disguise they can get near enough to use stone-tipped arrows. But they often go hungry and will eat anything from ants' eggs to a stranded whale.

Hunting is wasteful, for it destroys, but never increases, life. A great area will feed only a few hunters, and so the Bushmen roam in families in search of water and game. Their clothing is very scanty, their shelters mere windbreaks of brushwood or skins. Against invaders of a higher and stronger type their only defence is to retire further into the desert as did the native Australians.

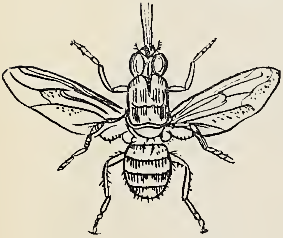
The forest tribes are better off. The people called the Fang on the Ogowe River, between the Congo and the sea, will show us the sort of life the ancestors of the American slave-



Two Africans, showing the strong bodies and woolly hair of the negro (though one has shaved his head). They have adorned their faces by cutting marks in their skins.

stock lived in their own country.

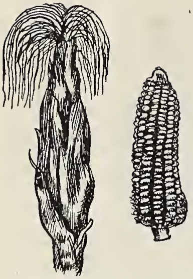
Where the forest remains, it is more open than that of the Amazon. There is less undergrowth and fewer climbing plants, but the lofty leafy covering still hides the sun. The Fang build villages of leaf-thatched huts, but they spend much time fishing and hunting in distant parts of the forest. What they catch they mostly eat at once, gorging till they can hold no more. When the forest fruits ripen, the women and children gather them, while the men protect the workers from danger. Their gardens are made by burning an area of forest and planting bananas, coco-yams, sweet potatoes and manioc (which is an importation from Brazil). But they merely scratch the soil, and a garden is soon exhausted, so they must start again elsewhere. The village itself falls to ruins in four or five years, if a herd of elephants or a hostile tribe has not destroyed it before, and the whole population moves to another site to begin the restless round anew. This, too, is a wasteful way of life, but it shows the beginnings of cultivation.



Tsetse Fly (enlarged).

Millet, or Kaffir Corn, grows tall like maize. The picture shows the feathery flowers, which turn to small grains. These are dried, pounded, and made into cakes by the African natives. The small seeds given to cage birds in England are from certain kinds of millet. Millet is a grain plant of the drier parts of the Hot Belt, as maize is of the moister parts.

Although some forest peoples, like the Ashantis of West Africa, are of fine build and intelligence, the highest type of native life is generally found on the grasslands. These are very extensive in Africa and abound in game—antelopes of many kinds, zebras, ostriches and other rapid runners, together with the lions and leopards that prey upon them. But only a mounted hunter could hope to secure much food, and the African has no native horses. Cattle and crops must therefore provide his livelihood, and even cattle-keeping is impossible over wide areas on account of the tsetse fly. For the most

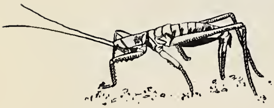


The "ear" of the maize plant and the "corn-cob" contained in it.

Maize is a native of the Americas, where it is called Indian corn or simply corn. The photograph shows that it is planted in rows, and the height may be judged by the post, which is $7\frac{1}{2}$ feet high. The seed grows on "cobs," which can be seen hanging from the plants.

part his millet and maize (another importation from America) are grown unskilfully. He scratches the surface with a hoe or digging stick and moves to new ground when the old ground loses its fertility.

Maize is the only grain which has been introduced from the New World to the Old. The plant



Locust.

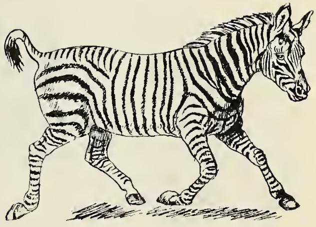
needs a growing season of at least seven warm months. Hence it will not ripen in the British Isles, but it is widely spread over the world between latitudes 45 N and 40 S, where rainfall is sufficient. In England it is not much used for human food except for cornflour, but elsewhere it may be made into cakes, or used as a vegetable like green peas; in South Africa, where it is called "mealies," it is one of the chief foods of native people. The stalks and leaves also are fed to cattle after the corn is harvested.

But the cattle-keepers are the aristocrats of the grasslands, and among the best of them are the Basutos. Basutoland is one of the three Native Protectorates of South Africa. It consists of two halves: the western high plains, hot and dry, but containing most of the villages, and the eastern Drakensberg highlands, cool and well watered. Good use is made of each.

The Basutos love cattle, but they are also cultivators. The land belongs to the nation, and the chiefs grant to each man his portion for the season. On it he grows his maize or "mealies," but after the harvest the field returns to common use as pasture.

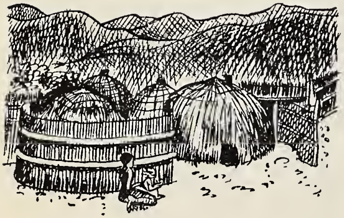
Ox-ploughs are used on the plains, and the men drive them, working for themselves or their chiefs. For cattle are a man's business, the sign of his wealth, the price of his wives. But the hoeing and weeding and the pounding of the corn are left, like the cooking, to the women. While the crops are growing in the unfenced fields, the cattle are sent up to the rich mountain pastures. After the harvest they are brought down again to browse on the stalks and leaves of the maize; but when these are finished the cattle have a lean time, for grass is scarce in the dry winter.

Unlike the Indians and the Australian natives, the Africans have not decreased with

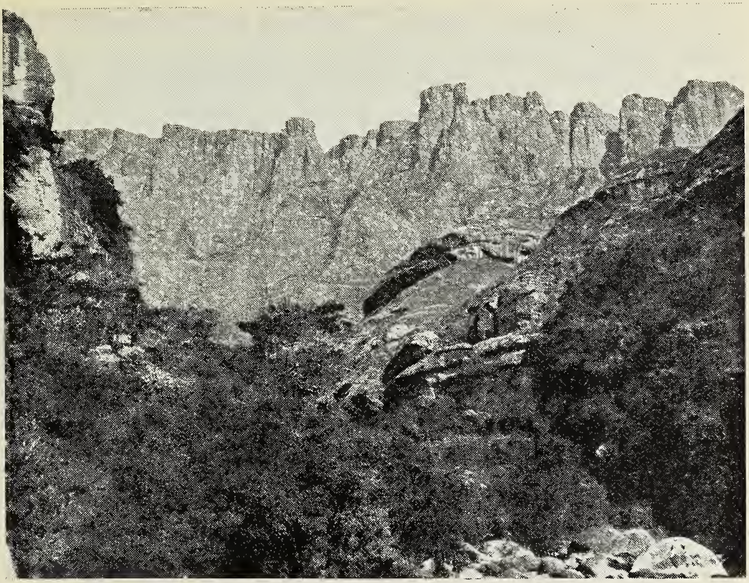


ZEBRA.

the arrival of the white man. The Basutos are actually increasing, and their land will need more careful farming to feed its population. This they should learn in the missionary schools established in their country. But their chiefs are faced with many problems, one of the greatest of which is the unsettling effect of work in the gold-mines on the young men. There, they receive wages, a thing unknown in Basutoland, and return with new ideas and tastes and a lessened respect for the customs of their own people.



Native Hut with Windbreak.



The Drakensberg. The view shows the square towers and precipitous edges of the South African Tableland from the Natal side. The high summits are over 10,000 feet above sea-level. In the foreground is a deep, stony, wooded gorge.

CHAPTER 14

SOUTH AFRICA: THE COUNTRY

SOUTH AFRICA extends from the Cape to the Zambezi River. The hills and valleys of the coastal plain surround a high interior, which rises in height eastwards to the High Veld on which most of the farmers of European descent are settled, and to the massive edge of the Drakensberg. The general slope is shown by the course of the Orange River,

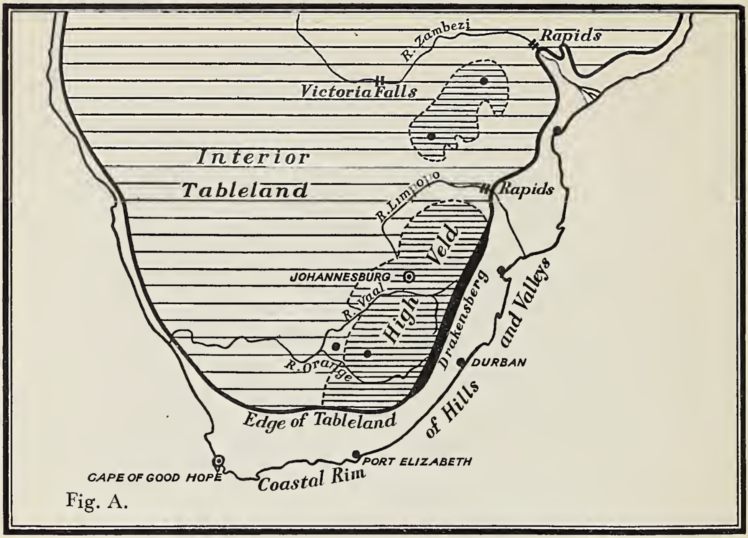

R. Zambezi
Rapids
Victoria Falls
Interior
Tableland
R. Limpopo
Rapids
High Veld
JOHANNESBURG
R. Vaal
Drakensberg
and Valleys
DURBAN
R. Orange
of Hills
Edge of Tableland
PORT ELIZABETH
CAPE OF GOOD HOPE
Coastal Rim

Fig. A.

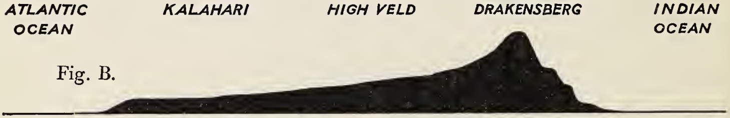
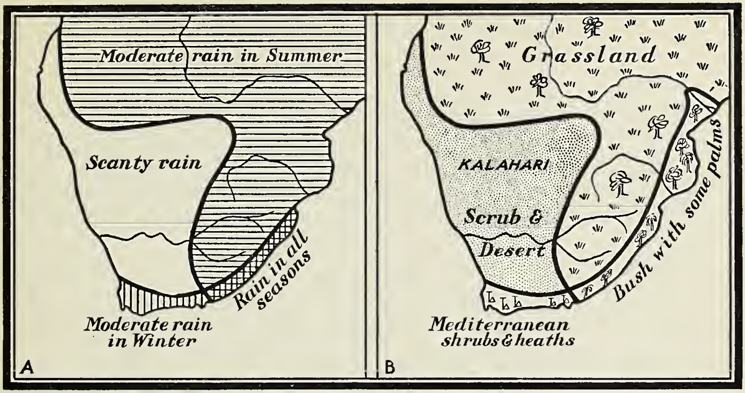

ATLANTIC OCEAN
KALAHARI
HIGH VELD
DRAKENSBERG
INDIAN OCEAN

Fig. B.

Fig. A. Surface Divisions of South Africa, showing the two great divisions of South Africa: (*a*) the low but rough coastal rim of hills and valleys, a comparatively narrow belt, (*b*) the interior tableland. Compare with the section and with the map in the atlas. The falls and rapids where the eastern rivers come down over the edge of the tableland are marked by bars across the river.

Fig. B. Section from West to East across South Africa. Notice that the tableland rises in height towards the east (the High Veld) and the Drakensberg and then drops steeply to the Indian Ocean. Heights are exaggerated as usual.


Moderate rain in Summer
Scanty rain
Rain in all seasons
Moderate rain in Winter
A
Grassland
KALAHARI
Scrub & Desert
Bush with some palms
Mediterranean shrubs & heaths
B

Seasons of Rain (A) and Natural Vegetation (B) in South Africa. These are enlargements of parts of the general maps of Africa on pp. 94, 95. They are set side by side so that you can compare them.

which rises in the Drakensberg in the east and flows to the Atlantic. The Drakensberg mountains are really the edge of the highland on its steepest side. They tower 10,000 feet above Natal, and the railway from Durban to Johannesburg finds no lower pass than one of 5,000 feet.

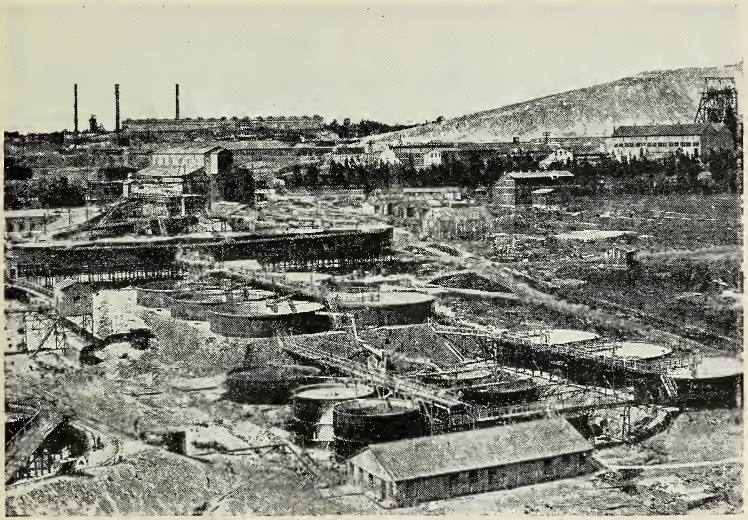
Nearly all South Africa lies, as we have seen, in the Hot Belt, and only its height makes the interior cool enough for colonisation. The south-east trades bring ample rain to the east coast, but the amount decreases westward, and the natural vegetation changes from the "Palm Belt" and "Bush" of the east coast through the grassy plains of the "High Veld" to the scrub and desert of the Kalahari.

The veld (Dutch for *field*) is the prairie or pampas country of South Africa, where the rainfall is insufficient for tree growth, but too great for desert conditions. It makes excellent grazing ground, and the best parts are ploughed for crops. In

Cattle Ranching on the High Veld. The view gives typical scenery—rolling surfaces covered with grass. The trees are low and thorny with small, hard, dry leaves. The scene should be compared with that of a cattle ranch in the interior of Australia on p. 21, and the similar, though not identical, conditions noted.

different parts it is known as High Veld, or Low Veld, or Bush Veld, names which explain themselves. Locusts often do great damage to the vegetation. Only the south-west corner comes within the Winter Rain Belt.

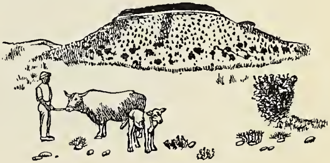
The dry air of South Africa is very different from the soft, moist climate of Britain. In the intense sunlight, which only nightfall or a thunderstorm obscures, summits a hundred miles away seem to lie just over the next ridge, and from the coastal plain the thorny bergs that fringe the tableland appear to " prop



Surface Workings among the Gold Mines of the Rand (Johannesburg), showing the winding gear from the deep shafts, the cyanide vats which collect the grains of gold from the crushed ore, and the tip-heaps of waste after the gold has been sorted out.

the speckless sky." The brilliant purples, reds and browns of the rocks stand out as in a poster on our English hoardings.

Beyond the ramparts of the upper country the veld rolls endlessly away, dotted with the flat-topped hills the Dutch call Kopjes (*Koppys*). The green that comes with the rains soon turns to brown, and soft earth gives place to dust, but the parched air is very bracing, and the nights are wonderful. Stars, of a brilliance that our clearest nights can never equal, shine down upon a stillness only broken by the cries of the jackals.



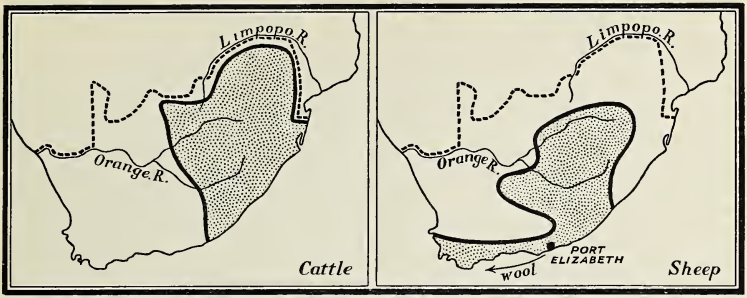
Kopje.

An Orange Grove in Natal. The orange has long been grown in South Africa, and an orange orchard often accompanies an old farm. Only recently, however, has the orange—and grape-fruit—been widely grown for export. In the background rise the flat-backed tabular hills characteristic of South Africa.

After our crowded island " with houses both sides of the street, and hedges two sides of the lane," you would feel lonely on this empty, silent veld, but the native-born farmer has learnt to love it, and the smoke of a distant neighbour's chimney seems almost an invasion of his quiet. The motor-car and the wireless, however, are breaking down the old liking for being alone.

The Dutch, who visited Australia before we did, made settlements in South Africa long before we came upon the scene. Table Bay had watched the Portuguese sail by for 150 years before the Dutch East India Company sent Jan van Riebeck to open a " tavern of the seas " upon its shores. Here beside the Cape of Good Hope, once called the Cape of Storms, they planned a halfway house where ships bound on the long journey to the East might find supplies of fresh water and vegetables.

Settlement went slowly, for the Company was anxious to avoid



Cattle and Sheep in South Africa. Notice that both are reared on the High Veld; but, whereas the sheep extend into the drier west, the cattle extend into the warmer north-east.

trouble with the natives. But the Dutch, with a sprinkling of French exiles and Germans, increased till they occupied most of the south-west. Only during the nineteenth century, after the Cape became British, did the Boers, the Dutch "farmers," trek up to the highlands and scatter over the open veld.

South Africa's progress, however, has depended far less on farming than on the discovery of diamonds at Kimberley and gold on the Rand or "ridge" of the Southern Transvaal. The gold-mines have made Johannesburg the largest city in South Africa out of a wind-swept wilderness 6,000 feet above sea level. Railways were built to take out the gold and bring in supplies, and the veld farmers have found a much-needed market for their products.

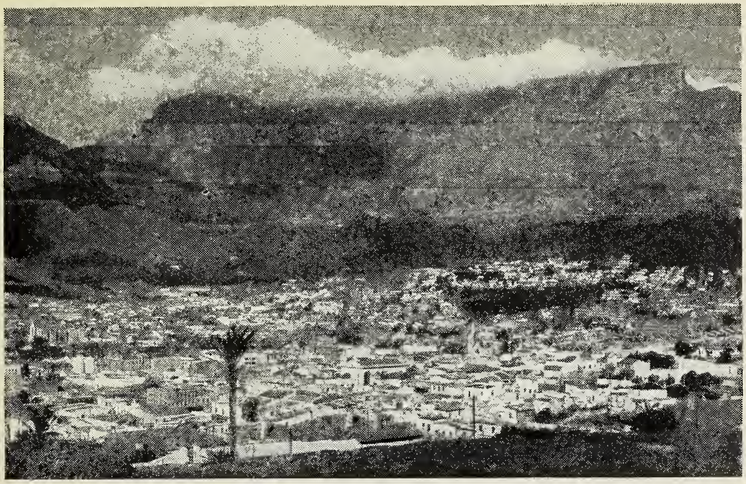
Today the mines produce half the world's gold supply and employ 250,000 men. Half of these are natives, for they work for small wages, and since three tons of "dirt" will only yield one ounce of gold, cheap labour is essential.

But mines, however rich, must one day be exhausted. Cultivation, on the other hand, improves the soil, so that it will remain a source of wealth when the last ounce of gold has been shipped beyond the seas. South Africans, therefore, are trying to make better use of the land.

Cheap labour is plentiful, but rain in summer is uncertain over most of the country. The most suitable crops are those whose roots go deep enough to find the water that has sunk into the ground. Fodder-crops and fruits like grapes and oranges resist drought better than grain. But in time, dry farming and drought-resisting wheats from Australia may prove successful. Australian salt-bush and alfalfa, as in Argentina, have done much for cattle and sheep, but there are many animal diseases, and jackals and locusts have also to be reckoned with.

Wool is mostly exported, but South Africa has not yet reached the dairying stage of New Zealand, nor does the white farmer export high-grade beef, as in Argentina. As for the native cattle-owner, he cares more for the number than the quality of his beasts, and in any case is not anxious to sell.

Old Dutch House.

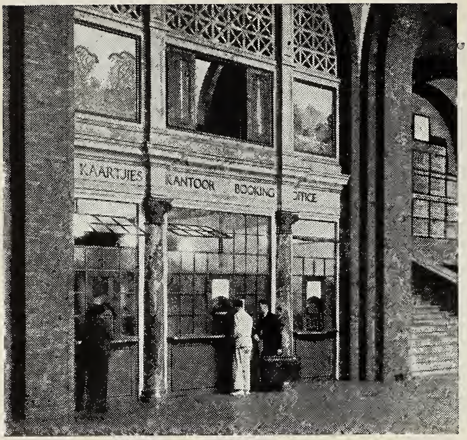


Capetown and Table Mountain from Signal Hill. The view looks south-east and shows the general setting of the city. Table Bay is to the left. In the background Table Mountain rises nearly 2,600 feet, meeting the sky-line along a front of two miles. The photograph shows the cloud, or " table-cloth," lying on its summit, brought by the south-east winds. The cloud, or mist, as a rule comes down with alarming suddenness, and to ensure the safety of pedestrians on the summit, sign-posts have been erected.

CHAPTER 15

SOUTH AFRICA : THE PEOPLE

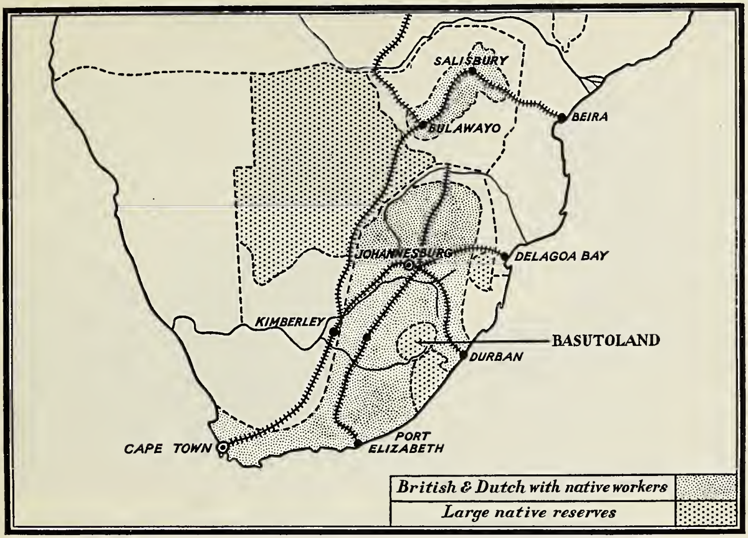
THE population of South Africa is gathered mainly, as in Australia, in the better-watered south-eastern half. But in Australia the people are almost all white, while the Europeans in South Africa hardly make a quarter of the whole. It is not surprising, therefore, that manufactures, which the natives scarcely need, have made little headway. Mining machinery, railway material and cars are imported from abroad.



Notices in Two Languages in the Union of South Africa. In this country of two languages notices are printed in both Dutch and English, as seen here over the Booking Office at the railway station at Johannesburg. Kaartjies Kantoor is the Dutch for Ticket Office.

River transport hardly exists, and even the Orange River gets very little of its water to the Atlantic. All the railways are drawn by the magnet of gold to Johannesburg. But a year's output of gold and diamonds would hardly fill a single ship, and the difficulty of making profitable the return voyage to South Africa increases the cost of imports. Wool, hides and fruit, which reach our northern markets just when our home supplies are shortest, help to increase the bulk of exports and so to spread the cost of the double voyage more evenly. Motors and lorries are replacing the slow waggons and their teams of sixteen oxen, but petrol is dear. Air-routes are not yet so well developed as in Australia.

The outstanding fact about South Africa's population of eight millions is the small number of Europeans it contains. The two million whites are about evenly divided between the Dutch stock and the British. Out of four once separate states—the Cape Province and Natal along the coast, the Transvaal and Orange Free State on the tableland—they have created one Union with the unusual arrangement of two capitals. The Government offices are at Pretoria, the old Boer

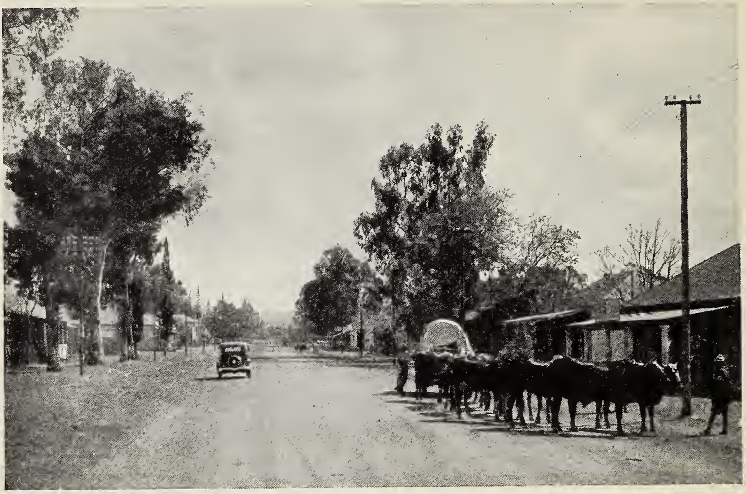

SALISBURY
BEIRA
BULAWAYO
JOHANNESBURG
DELAGOA BAY
KIMBERLEY
BASUTOLAND
DURBAN
CAPE TOWN
PORT ELIZABETH
British & Dutch with native workers
Large native reserves

Peoples and Railways of South Africa. The chief railways gather from the four chief ports to Johannesburg, the business centre of the gold-mining industry. The Capetown-Johannesburg expresses run via Kimberley. The nearest port for Rhodesia is Beira in Portuguese territory.

capital of the Transvaal, while Parliament sits in Capetown, where the British element is strongest.

But the two peoples speak different languages and differ also in outlook: the people of Dutch descent belong wholly to South Africa; the British, as is their way, regard Britain as "home." Past differences are not yet forgotten. But now that all officials and teachers must know both languages, and the railway and the motor-car are bringing the two peoples into closer contact, the old divisions will gradually disappear.

Dutch and British South Africans occupy the south and

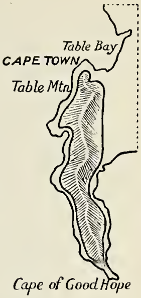


Typical Up-Country Town. The one-storeyed buildings have the usual corrugated iron roofs. The street is unpaved. The modern motor-car is seen beside the older ox-waggon under the charge of a native driver; note his long whip.

south-east coasts and the High Veld of the interior tableland. In Rhodesia white settlement is chiefly on the high ground along the railway.

One great problem faces Boer and Briton alike, and that is the future relations of the Europeans and the natives. For the native races show no sign of disappearing, as they have done elsewhere, and all thought of intermarriage with the whites is out of the question. Industry, moreover, is carried on by means of cheap labour. The average yearly earnings of Europeans in South Africa are £240, and those of the natives, whose needs are far simpler, only £50; it will be seen, then, how little room there is for the white labourer. The Europeans, therefore, in self-defence reserve the skilled trades for themselves, and the more educated natives are naturally dissatisfied.

Over two millions of the natives, however, still live in their kraals, or villages, on Native Reserves, like Basutoland. With them the difficulty lies in the scarcity of good land for their increasing numbers, since seven-eighths of South Africa belongs to the white minority, who do not wish to surrender it.



THE CAPE PENINSULA.

The solution of the problem depends upon the wisdom of both parties. It was a native who compared the two people to the white and black keys of a piano, which must each help to make the music. Only in this way can the future of South Africa be harmonious.

Capetown is the doorway to South Africa and its oldest city. The old Castle and Greenmarket Square remind us of its earliest uses. It stretches round the shores of Table Bay, gleaming white in the brilliant sunshine, while behind it rise the frowning masses of Table Mountain and its flanking heights, the northern end of the ridge that ends in the Cape of Good Hope. At first sight the face of the mountain appears to be an unbroken precipice, but at close quarters we find two deep gorges; and the top, far from being flat, is seamed with flower- and fern-decked glens and rushing cascades.

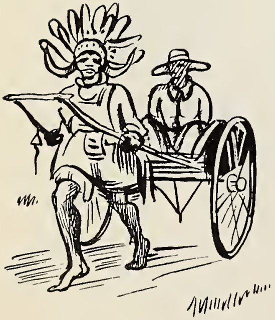
GIRAFFE.

Durban, far to the east, feels the warm Mozambique current. Bathing is pleasanter here than in the cooler water off Capetown. Its moister and more relaxing climate is shown by the number of jinrickshas, drawn by Zulus, which carry its inhabitants about their business and pleasures.

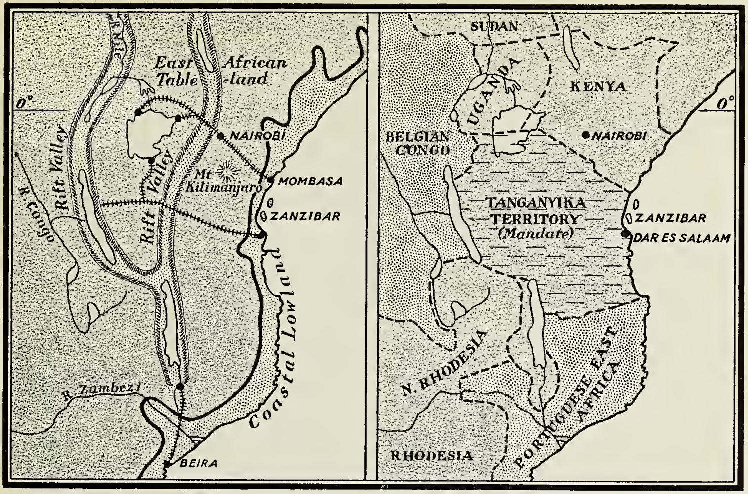
Pretoria lies in a hollow of the highlands. It is a well-laid-out city in surroundings very different from the chimneys and dust heaps of the gold-mines round Johannesburg. In the outskirts of Kimberley the barbed-wire fences of the diamond company show that it is little more than a mining camp. Its population is decreasing.

Southern Rhodesia is a continuation of the South African tableland. Here also gold was the first attraction, but settlers soon spread over the High Veld on either side of the railway to plant maize, tobacco, and cotton, and harvest them with native labour. On its north-west frontier lie the famous Victoria Falls of the Zambezi.

Cecil Rhodes, after whom the land is named, had dreams of a United South Africa stretching as far north as the Zambezi; but the Union stops at the Limpopo. Rhodesia has refused to join South Africa and remains an almost self-governing country of 50,000 whites and a million natives.



Zulu Ricksha Boy.

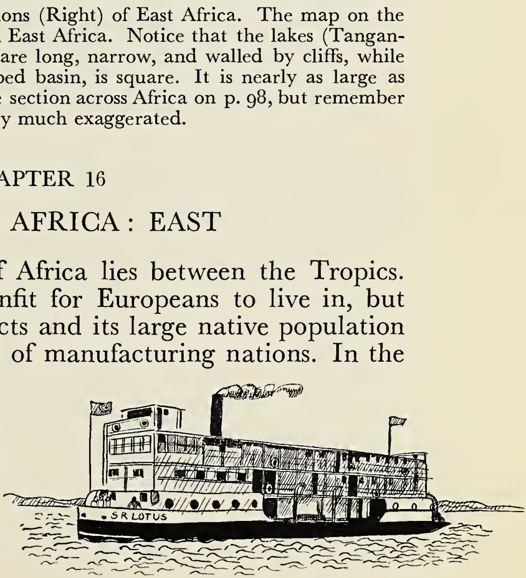

R. Nile
East African Table-land
0°
Rift Valley
NAIROBI
Rift Valley
Mt Kilimanjaro
MOMBASA
R. Congo
ZANZIBAR
Coastal Lowland
R. Zambezi
BEIRA
SUDAN
UGANDA
KENYA
0°
BELGIAN CONGO
NAIROBI
TANGANYIKA TERRITORY (Mandate)
ZANZIBAR
DAR ES SALAAM
N. RHODESIA
PORTUGUESE EAST AFRICA
RHODESIA

Surface (Left) and Political Divisions (Right) of East Africa. The map on the left shows how varied is the surface in East Africa. Notice that the lakes (Tanganyika and Nyasa) in the Rift Valleys are long, narrow, and walled by cliffs, while Lake Victoria, lying in a saucer-shaped basin, is square. It is nearly as large as Scotland. Compare this map with the section across Africa on p. 98, but remember that in the section the heights are very much exaggerated.

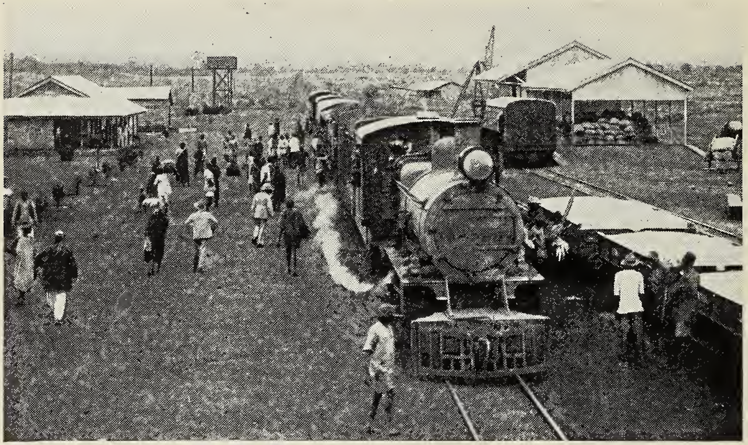
CHAPTER 16

TROPICAL AFRICA: EAST

THREE-QUARTERS of Africa lies between the Tropics. Much of it is quite unfit for Europeans to live in, but its richness in natural products and its large native population made it valuable in the eyes of manufacturing nations. In the last fifty years the peoples of Western Europe have been busy dividing it out between



Lake Steamer.



Uganda Railway. The line photographed here is a branch which runs from Nairobi to the foot of Mt. Kenya. The picture shows the grassy nature of the country (savanna) and the mixed population. Europeans, natives, and Indians can be seen at the station. The engine carries a large head-lamp and a cow-catcher. The station and warehouses have the almost universal corrugated iron roofs that mark European buildings throughout Kenya Colony.

them. Thus they secured command of its mineral wealth and raw materials and hoped to find in the inhabitants customers for their goods. They have since realised that control also brought with it the duty of caring for the welfare of the people.

The biggest shares fell to France, Britain, Germany and Belgium. Portugal already held large areas, the relics of her early discoveries, the rest belongs to other nations. Even Abyssinia has now passed into the hands of Italy. But the fortunes of war have deprived Germany of all her colonies, and the League of Nations has entrusted most of her African possessions to France and Britain on " mandates " which secure equal treatment for all comers.

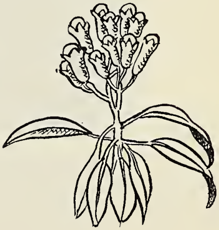
French Africa lies mainly to the west, British Africa to the east, but each, if we include the French island of Madagascar, holds important areas on the other side. The central Congo Basin is Belgian.

East Africa is a highland region 2,000 miles long, bordered on the west by a series of great lakes, on the east by a low, hot coastal belt. The Uganda Railway from Mombasa to Lake Victoria rises to 9,000 feet. Even on the Equator such heights are fairly cool, and a few thousand Europeans are settled, chiefly in South Kenya, where they cultivate coffee and other crops. Nairobi stands 5,000 feet above the sea. It is the centre of the region of British settlers and is the capital of Kenya.

Uganda is a Native Protectorate, like Basutoland, and, under Government teaching, the people have learnt to grow cotton for export. In Tanganyika Territory, a former German colony now in British hands, natives and foreigners of many nations admitted under the mandate grow cotton, maize and ground-nuts.* All round Lake Victoria, therefore, we find natives and Europeans with native labourers working on equal terms. The second railway from the coast, which branches to Lake Victoria and Lake Tanganyika, is valuable as a second route for the export of their crops.

To the south, Nyasaland and Northern Rhodesia complete our East African possessions. Tobacco is here the chief crop, but the only railway is the " Cape to Cairo," which crosses Rhodesia, to end, for the present, halfway down the Congo. In Belgian territory, however, it now meets a line from the west coast, which offers a useful exit for Rhodesian copper and other produce.

The East African tableland is much more varied than the level veld of the south. Two rift valleys, 50 miles wide and 1,000 feet deep, furrow



Clove Flower Buds.

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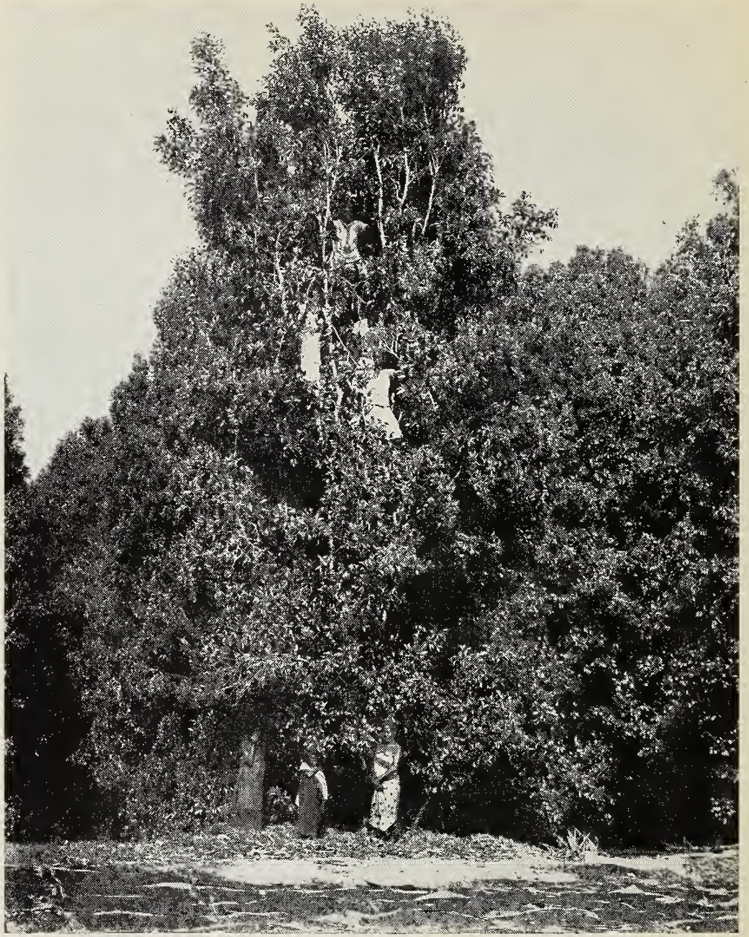
* See page 137.

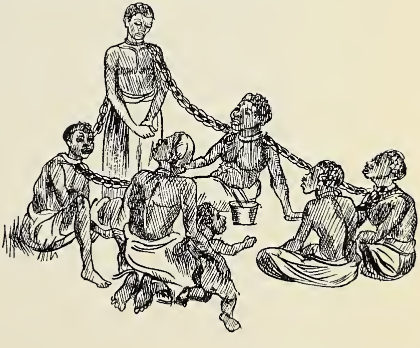


Clove-Growing in Zanzibar. Cloves, used as spice, in apple tarts for instance, are the flower-buds of a tree, dried before opening. When picked they are spread out on the ground to dry. The tree was introduced to Zanzibar from the Moluccas or Spice Islands more than 100 years ago.

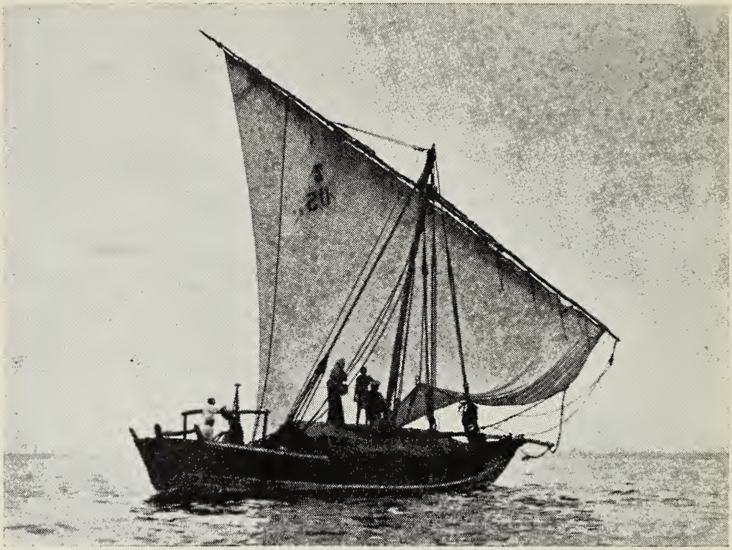
Street Scene in Zanzibar. Zanzibar is a jig-saw of narrow winding lanes and valleys, slum-like and monotonous, with colour-washed walls and shuttered windows, relieved here and there with a heavily carved doorway. Africans (Swahilis), Arabs, Indians, and Europeans jostle one another in the streets. Bicycles are very popular.

its surface, and massive volcanic cones rise above it. Mount Kilimanjaro is 200 miles round the base. Its summit, which the natives call the "House of God," is always capped with ice, though it lies so near the equator. All the great lakes, except Victoria, lie in the Rift Valleys, but drain to three different seas by way of the Zambezi, the Congo and the Nile.

The Arabs of Southern Arabia reached this region, long before any Europeans, in search of ivory, slaves and spices. The slaves they captured were made to carry the ivory to the coast, where both were sold in the market of Zanzibar. The slave market, after a long and bitter struggle, is abolished, the establishment of Game Reserves has diminished the supply of fresh elephant tusks, but from the clove-trees of Zanzibar



A Slave Gang.

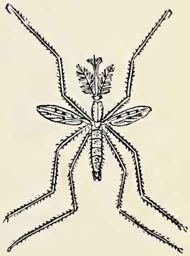


Arab Dhow near Zanzibar. The dhow, a craft of 150 to 200 tons, is found all over the Arabian Sea, Persian Gulf, and Red Sea. It has an open waist and high poop; its stern rises in a long slope from the water. Generally there is one mast which carries a very long yard-arm at an angle of 45 degrees. The sail is arranged with a long forward overhang.

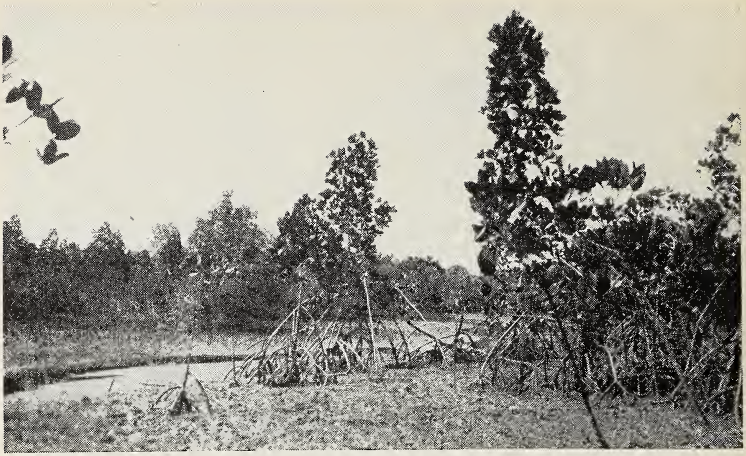
Island the Arabs still supply the world with spice. Zanzibar harbour, well sheltered by the island, which is fifty miles long, is crowded with their trading dhows. Much of the coasting trade of East Africa is carried by these vessels. But beside the narrow lanes and whitewashed walls of the old town rise Government House and the modern hospital, to proclaim British control of what was once " a cesspool of wickedness." The English cathedral stands in the old slave market, its altar over the whipping post and its crucifix carved from the tree in Central Africa under which David Livingstone died.

Livingstone was first a missionary and afterwards a great traveller, the discoverer of the Victoria Falls and the explorer of Lake Nyasa and Lake Tanganyika. In the course of his thirty years' travels he saw the worst horrors of the Eastern slave trade, and his reports led at last to its suppression. The people loved him, and even the Arab slave traders admired and respected their stout-hearted enemy. Inspired by his example, the missionaries who followed him have done magnificent work among the Africans whose welfare he had so much at heart.

The slave trader has gone, and the worst enemy of tropical Africa to-day is sleeping-sickness, which is spread by the bites of the tsetse fly. The same insect also carries a disease which makes it impossible to keep horses or cattle in many districts, and this is one reason why travellers have to employ native porters to carry their baggage. Sleeping-sickness has been known to kill 200,000 people in Uganda in five years. The only remedy is to destroy all vegetation round villages, so that the tsetse cannot live there. But there are recognised "fly-belts" where neither man nor domestic animal can live at all. Wild animals are apparently not affected by the bites of the tsetse.



Mosquito (enlarged).

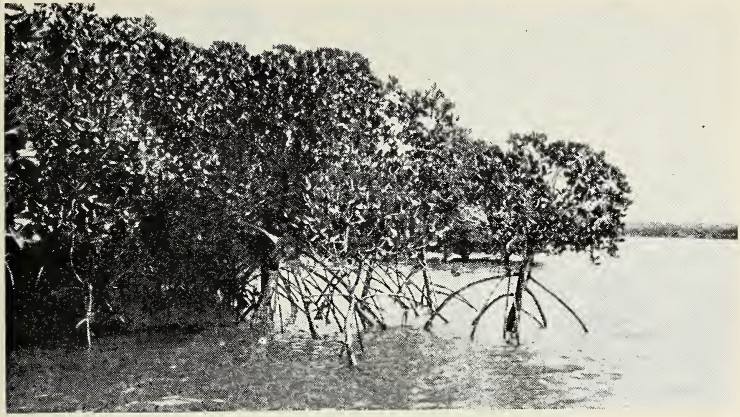


Mangroves at Low Tide. The mangrove tree grows in the mud between the limits of low and high tide along coasts near the equator. The trees are seen to rise from what looks like scaffolding of stilt-like roots: by means of these it holds itself upright and resists the movements of the water as the tide goes in and out.

CHAPTER 17

TROPICAL AFRICA: WEST

THE Gulf of Guinea, round which West Africa lies, has scarcely a single bay to shelter ships from a rough sea. For a thousand miles east of Freetown there is no natural harbour; and the sea is never still. The shore line is smooth, shallow, and beaten by a continuous surf driven by steady on-shore winds. Except at Takoradi in the Gold Coast, where there is deep water, and at Lagos, where the approach has been dredged to a depth of 25 feet, ships must stand out to sea. Goods and passengers must be transferred in special surf-boats, and even so will hardly escape a wetting. If the surf-boat once

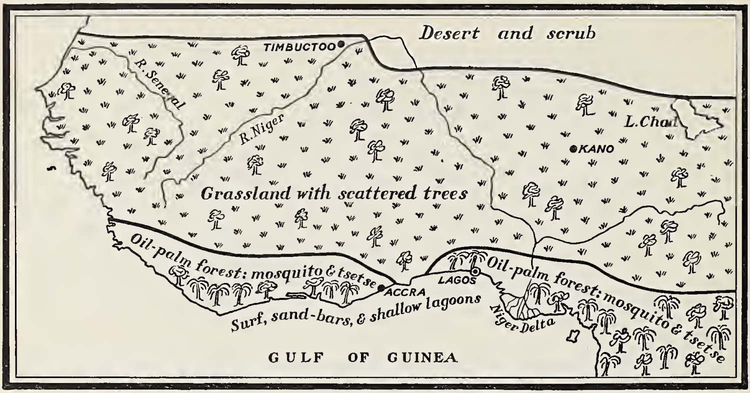


Mangroves at High Tide, when one sees only a mass of bright green foliage and the tops of the roots.

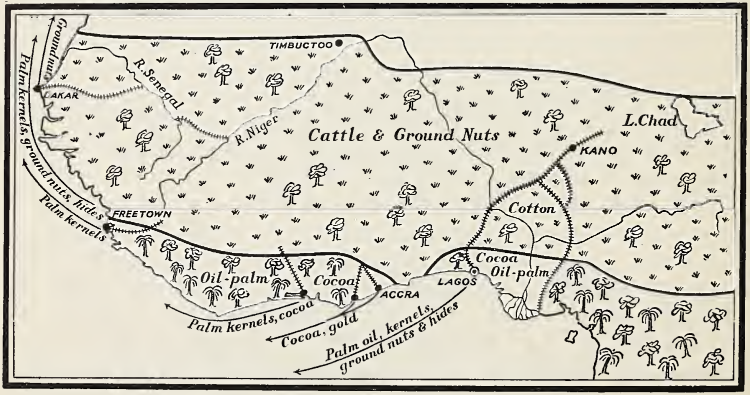
turns sideways to the waves, lives are only too likely to be lost. West African beaches do not invite intruders from the sea.

And those who land there must face another peril. The mosquito that spreads malaria breeds in the swamps of the coastal forests, and comes out at night to bite the unprotected. The natives are hardened to the poison, but the European suffers seriously and often fatally. The welcome of the mosquito is worse than the unfriendliness of the surf.

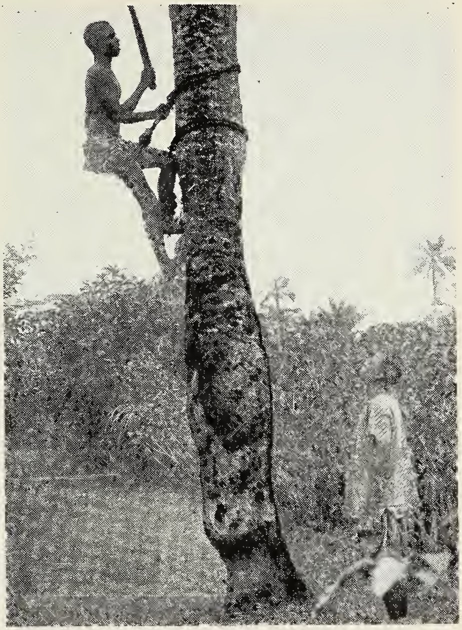
There is another way into West Africa. Beyond the damp forests of the coast lie the dry highlands of the interior along which the Mohammedans from the east have brought their donkeys and horses, and the tribes of the Sahara their camels, to trade in the cities of the Western Sudan. They have conquered the darker peoples of the uplands and taught them religion and in some ways improved their lives. But they have not penetrated


Desert and scrub
TIMBUCTOO
R. Senegal
R. Niger
L. Chad
KANO
Grassland with scattered trees
Oil-palm forest: mosquito & tsetse
ACCRA
LAGOS
Oil-palm forest: mosquito & tsetse
Surf, sand-bars, & shallow lagoons
Niger Delta
GULF OF GUINEA

Natural Vegetation and Some Insect Pests in West Africa. Notice how the vegetation lies in bands parallel to the coast: forest, grassland and desert. The map shows that the mosquito which carries malaria to human beings and the tsetse fly, whose bite poisons horses and cattle, are insects of the forest belt. There are therefore very few cattle near the coast, but many on the grassland.


Groundnuts
Palm kernels, ground nuts, hides
AKAR
TIMBUCTOO
R. Senegal
R. Niger
Cattle & Ground Nuts
L. Chad
KANO
Cotton
FREETOWN
Palm kernels
Oil-palm
Cocoa
ACCRA
Cocoa
Oil-palm
LAGOS
Palm kernels, cocoa
Cocoa, gold
Palm oil, kernels, ground nuts & hides

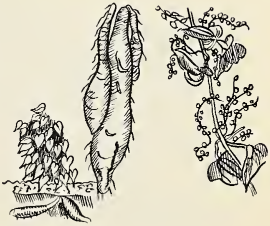
Products of West Africa. Each belt has its special products—palm-oil and cocoa in the forest belt, cattle, ground-nuts and cotton in the grassland belt. The railways that bring these to the coast are marked, and the arrows show the products exported to Europe.



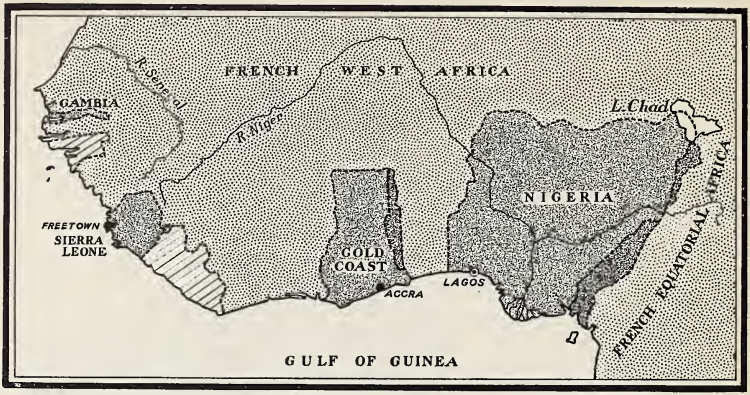
Native Climbing a Palm Tree in West Africa. The native boy is climbing the branchless trunk of an oil-palm by means of a rope tied round his right thigh and under his left foot. He carries a large knife or *machete* with which to cut down the bunch of palm-nuts.

the forest belt, for there the tsetse fly killed all their animals and threatened their own lives with the dreaded sleeping-sickness. Such produce of the forests as reached their markets at Kano or Timbuktoo came out on the heads of native carriers, but for the most part the people of the Sudan traded east and north, for even the burning Sahara was easier to cross than the unhealthy depths of the forest.

All that northern region now belongs to France, and her territories come down to the coast between the British possessions, enclosing them on all sides but the sea. From the narrow strip along the Gambia River, the British colonies grow wider and extend further and further inland until Nigeria reaches out to Lake Chad and the edge of the Sahara. But they nowhere cross the continent as the French lands do.



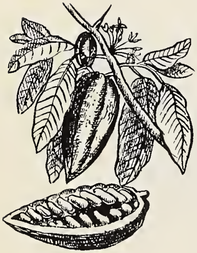
Yams: Root and Foliage.


FRENCH WEST AFRICA
R. Senegal
GAMBIA
R. Niger
L. Chad
NIGERIA
FRENCH EQUATORIAL AFRICA
FREETOWN
SIERRA LEONE
GOLD COAST
ACCRA
LAGOS
GULF OF GUINEA

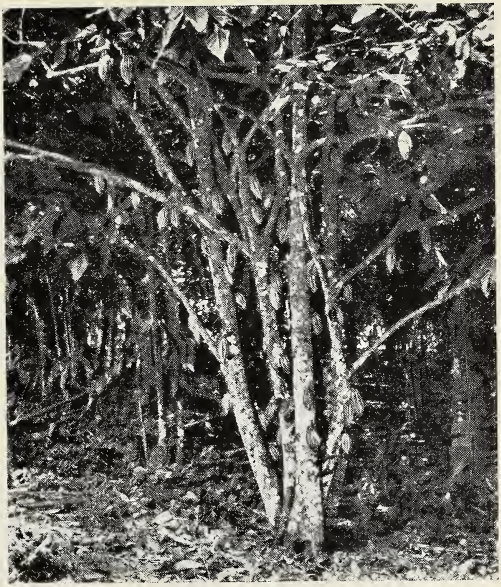
Political Divisions in West Africa. The four British colonies are named.

Britain and France have built both harbours and railways and are gradually changing the lives of the forest peoples, for means have been found to deal at least with the mosquitoes and make West Africa healthier for Europeans. Schools have been established both by the Governments and the missionaries, and the African is learning the value of his country's products and the proper way to harvest them. The forests yield palm-oil, the clearings cocoa, and the uplands ground nuts, and these are the things that the rest of the world most values from West Africa.

Cocoa is now a much more important product of the Gold Coast than gold. It has nothing to do with the coco-nut, though that grows there too. This would be plainer if we spoke of cacao, which is its true name, instead of cocoa. The cacao tree is about the size of an apple tree. The pods are about as big as a large lemon but are longer and ribbed. They grow on short stalks direct from the trunk and larger branches. When



Cut-open Cocoa Pod.

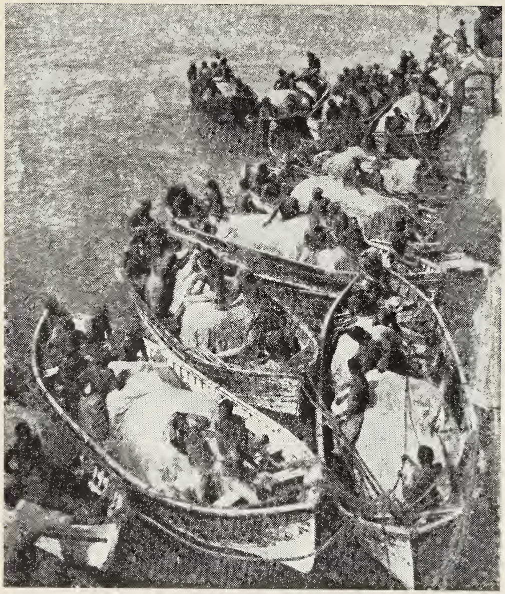


Cacao Trees. The cacao tree requires great heat and moisture, shade from a strong sun, and shelter from strong winds which might break off the pods. It is therefore mostly grown under a cover of forest trees.

ripe, the pods are gathered, split with a knife, and the twenty to forty beans inside scraped out. The juicy pulp is allowed to drain away, and the beans are dried and packed into strong jute bags for export.

Palm-oil comes from a tree not unlike the coco-nut palm, though the fruit is like the horse-chestnut. The soft outer rind is boiled, and the oil run off into barrels, but the kernels are exported whole to be crushed on arrival, for they too are rich in oil. Both forms are used by the soap makers, and since we must have soap, the demand for palm-oil is very great. The makers of margarine, candles and lubricating oils also use large quantities of palm-oil.

Ground-nuts are better known to us as monkey-nuts. The plant came originally from South America. It has the strange habit of bending over and driving its nuts into the ground to finish ripening. Ground-nuts are valuable as food, and the oil



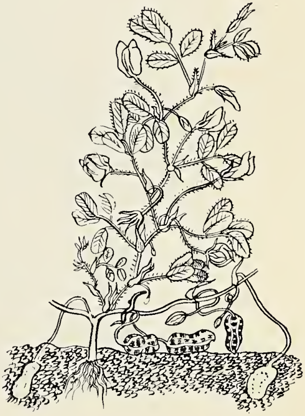
Surf-Boats taking Cacao to a Liner. The surf-boats are shown in the picture alongside a liner on the right. Each boat can be seen to be stoutly built and to be manned by a crew of eight or more. The men are far-famed for their skill in paddling the boat through the breakers. The cargo, sacks of cacao-beans in this case, is covered with tarpaulins, but even so a drenching with much damage to the beans is not uncommon.

they contain is used largely for cooking.

The railways are drawing southwards to the coast a good deal of the Sudan trade that formerly went north to the Mediterranean or east to the Nile. Trains do not suffer from the tsetse fly, and, unlike native carriers, they never strike nor, if properly handled, go sick. A single train will take the load of 13,000 carriers at one-twentieth of the cost. The railways, such as that which runs from Lagos to Kano, are also giving employment to those natives who are willing to abandon the old, unchanging customs of their tribes and work as linesmen, engine-drivers or clerks. There is no question here, as there is in South Africa, of keeping skilled trades out of native hands, for the simple reason that there is nobody else to follow them.

The few Europeans are either Government officials, missionaries or traders, and all manual labour is done by the African under white managers.

The Niger is by far the biggest river, but only sections of it can be used for transport. The great bend in the French Sudan is separated by rapids from the lower course through Nigeria. It is only in the last hundred years that the Oil Rivers east of Lagos have been recognised as the delta of the Niger. At one time it was even thought that it flowed into the Congo.



GROUND-NUT PLANT.

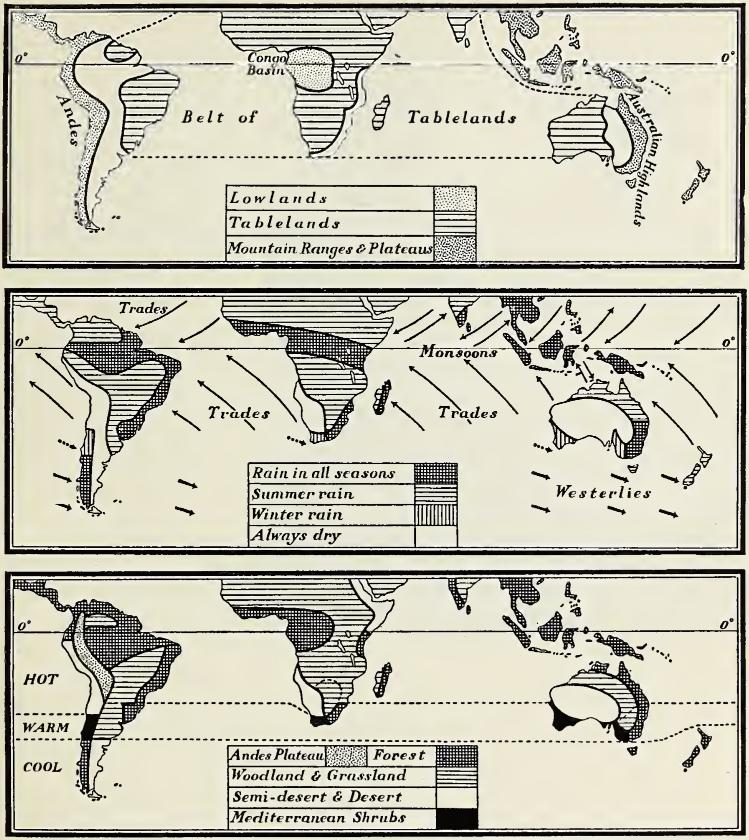
South America: Indian Ploughing. A young Indian or half-breed boy is ploughing rough ground for maize or potatoes in the Andes of Peru. The plough is a primitive affair made of wood and capable only of turning over a shallow furrow.

CHAPTER 18

A LAST LOOK AT THE SOUTH

AS we are passing now to more northern latitudes, it will be useful to take stock of the lands we are leaving behind us. In this chapter we shall quickly revisit the people we have seen from the Tropics to the Southern Ocean and compare the uses that Europeans, and our own countrymen among them, are making of the different regions.

Only in the highlands of the Hot Belt, where the climate, as in Kenya, Ecuador or Central Queensland, is not unpleasantly hot, can people of European stock make satisfactory homes. Elsewhere, as in West Africa, the Amazon Valley or North


0°
Congo Basin
Andes
Belt of Tablelands
Australian Highlands
Lowlands
Tablelands
Mountain Ranges & Plateaus
Trades
Monsoons
Trades
Trades
Westerlies
Rain in all seasons
Summer rain
Winter rain
Always dry
HOT
WARM
COOL
Andes Plateau
Forest
Woodland & Grassland
Semi-desert & Desert
Mediterranean Shrubs

Natural Conditions of the Southern Continents: Surface divisions (upper map), winds and seasons of rain (middle), natural vegetation (lower). Look for ways in which the three continents are alike.

Australia: Two Australian Natives or "Black-Fellers." The features are negro-like with broad flattened noses, but the hair has not the short curly twist of the African. Their skins are "decorated" in primitive fashion with scars, but they are wearing trousers and are seated on chairs made in the white man's factories.

Australia, they find it more difficult to bring up their families or work comfortably out of doors themselves. They must be content to look after the work of others more fitted to the climate, and in the end they must follow their children to cooler regions, if they are not to die before their time. In such places Europeans become traders, shipping the wild rubber and palm-oil of the Amazon and Congo forests or the copra of the Pacific Islands; or else they become overseers of plantations of tropical products like cocoa or cane-sugar.

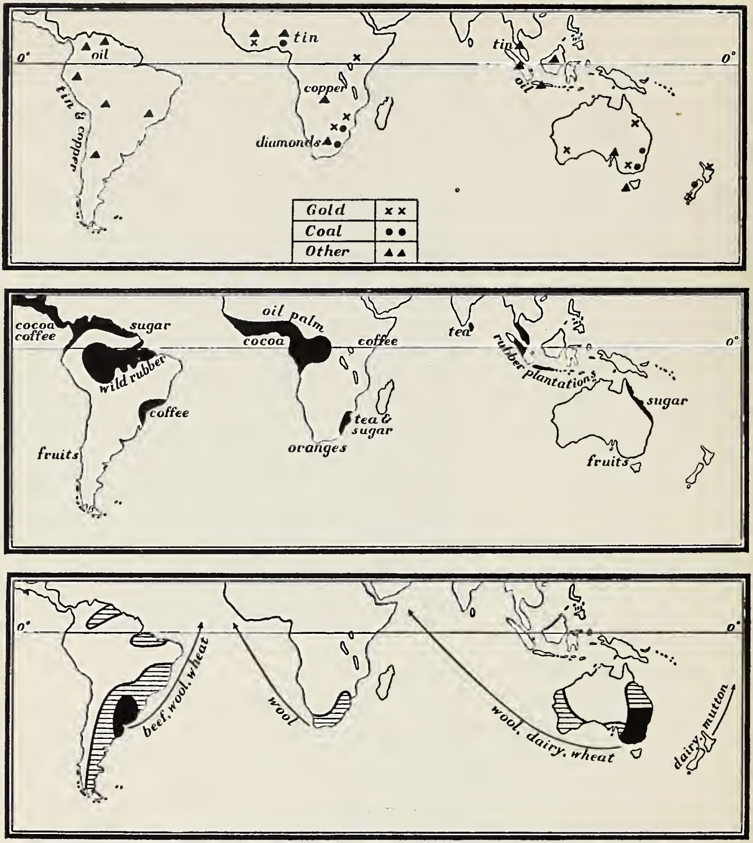
Within the Warm Belt, thanks to the south-east trade winds, the eastern regions are the most highly developed. The rain falls in such abundance on the eastern coasts as to produce dense " bush," which may be cleared to give place to the sugar-cane and various fruits, as in Natal, or to dairy-farms, as in Australia. Further inland, as the rainfall decreases, the bush gives place to grass-lands, and there the stock-men flourish. So Australia, Argentina and South Africa are all producers of wool, while the first two are exporters of meat and of butter in increasing quantities.

But the food-grains of the world, such as wheat, are only the seeds of certain kinds of grass improved by careful breeding through thousands of years, and they still require much the same conditions as other grasses. It is not surprising, therefore, that wheat-farmers in Australia and Argentina are taking over more and more of the land that was once grazed by sheep and cattle.

West again of the grass-lands each of the southern continents contains a desert region, lying with remarkable regularity across the Tropic of Capricorn and reaching to the western coast. Too far south for the rains that follow the sun, too far north for those of the winter westerlies, and so far west that the trades have no moisture left for them, these deserts are only of value when they contain minerals, like the gold of Western Australia or the nitrates of Chile.

The most serious defect of the south is the lack of land in the Cool Belt. Africa and continental Australia have none at all, and the South American peninsula narrows rapidly south of 35 degrees. When we think of the great agricultural and industrial populations that flourish in the Cool Belt of the north, we realise that the southern continents can never rival the northern. Little but Tasmanian apples, the mutton and butter of New Zealand, and the wool of Patagonia comes to us as yet from the Cool Belt of the south.

One important advantage lies nevertheless with the southern producer: he harvests his crops when his northern competitors are in the middle of winter. So his fruit and corn can reach


oil
tin
0°
tin & copper
copper
diamonds
tin
oil
Gold ××
Coal ●●
Other ▲▲
cocoa
coffee
sugar
wild rubber
coffee
fruits
oil palm
cocoa
coffee
oranges
tea & sugar
tea
rubber plantations
sugar
fruits
beef, wool, wheat
wool
wool, dairy, wheat
dairy, mutton

Some Products of the Southern Continents: Minerals (upper map), some plant products (middle), animal and corn products (lower). Notice (*a*) how little coast there is, (*b*) how far the products of the three continents are alike.

South Africa: Primitive Native Life remains and is shown by the dark-skinned woman preparing the midday dinner of "mealies" and by the circular thatched huts. But the influence of the white man has introduced not only cup-kettle, cooking-pot and blanket-skirt, but also the concrete walls, square doors and windows of the huts.

our European markets when home supplies are lowest. To us this means greater security against shortage, and a variety in foods undreamt of by our grandfathers.

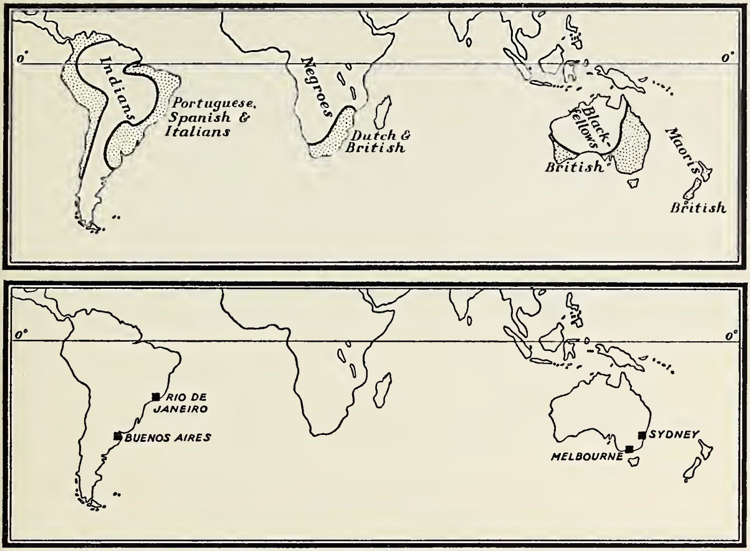
Between the southern continents themselves there have been interchanges of lasting importance. African slaves, however unwillingly, supplied South America's early need of labourers, and South America in return gave Africa the maize-plant and the manioc to feed her native populations. She also gave them something they would willingly be without, the chigo or jigger, a tick which attacks the soles of their naked feet. Australian gum-trees are widely grown in South Africa and also in Argentina.

In all three continents minerals have played a large part in attracting settlers and hastening railway construction. Gold and diamonds are still the main source of South Africa's wealth; to silver and gold South America owed its earliest fame; gold drew men in crowds to Australia; West Africa and New Zealand have also produced much gold. Men will dig for gold under any conditions; the reward, if they find it, outweighs all dangers and discomforts. Other minerals, such as coal, are less attractive and are worked at a later stage, but in all the southern lands the "baser" minerals are now eagerly sought, for manufactures depend mainly on coal and iron.

But factories are not yet of great importance in these countries, for manufactures only flourish when workmen are plentiful and the population large enough to provide a sufficient home market. So industry is mainly limited to flour-milling, butter-making and the canning and freezing of meat, for these are the processes that make the products of the land saleable abroad. The day has not yet dawned when even Australia no longer requires machinery and "luxury" goods from overseas, and no other southern country is as near to it as she.

All new countries are faced with a shortage of labourers. In the Hot Belt this problem is solved partly by employing the natives and partly by importing workers who can stand the heat. The negro is the manual labourer of Africa, the Japanese and Indian coolies have found employment in South America and the Pacific Islands, while Italians cultivate the coffee of Brazil and the sugar of Queensland. The crops and animal products of the Warm and Cool Belts are dealt with, wherever possible, by machinery.

So far in this chapter we have regarded the southern countries only as the homes, permanent or otherwise, of Europeans. But none of them was entirely uninhabited when the Europeans arrived. For the most part the natives lived by


0°
0°
Indians
Portuguese, Spanish & Italians
Negroes
Dutch & British
Black-fellows
British
Maoris
British
0°
0°
RIO DE JANEIRO
BUENOS AIRES
SYDNEY
MELBOURNE

Some Human Features of the Southern Continents. Colonising peoples and natives (upper map), cities with over a million inhabitants (lower). There are thirty-three cities of over a million inhabitants in the world. The other twenty-nine are all in the Northern Hemisphere.

hunting; and since it has been calculated that, even when game is plentiful, each hunter requires ten square miles of country to supply his own and his family's needs, it follows that the population was scanty. In Africa, simple forms of tillage and herding were more common among the natives, but the lion and the antelope, the zebra and the elephant ranged almost undisturbed over countless miles of fertile land. Nations already cramped for room at home were attracted by these wide spaces in the south, and Western Europe was first in the field.

Naturally the interests of natives and Europeans clashed, with results generally disastrous to the natives. In some cases, as in parts of South America and in New Zealand, the remnants have mixed with their conquerors or are likely to do so sooner or later. Elsewhere in South America and in Australia the native tribes are dwindling and seem fated to die out, as the Tasmanians have already done. But the Africans will neither perish nor be absorbed. They far outnumber the whites today and are likely to continue to do so. This contact of races that compete one with the other, yet can never unite, is one of the future's most difficult problems, and it will need the greatest wisdom and sympathy on both sides if it is to be solved.

KUDU

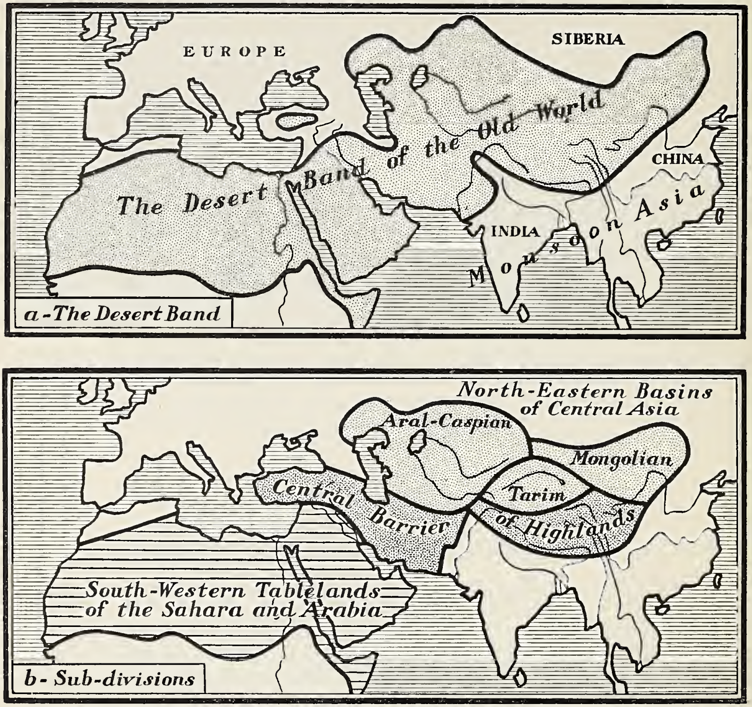
The Sahara. For travelling over soft sandy surfaces the camel is well suited by the broad pads of its feet. The one with long thin legs shown in the picture is a "racing" camel and can travel more than fifty miles a day and go for a week without water. The stone pillar is a guide post, for there is little else to give direction. (The clouds suggest that rain does sometimes fall.)

CHAPTER 19

DATES AND CAMELS OF THE SAHARA

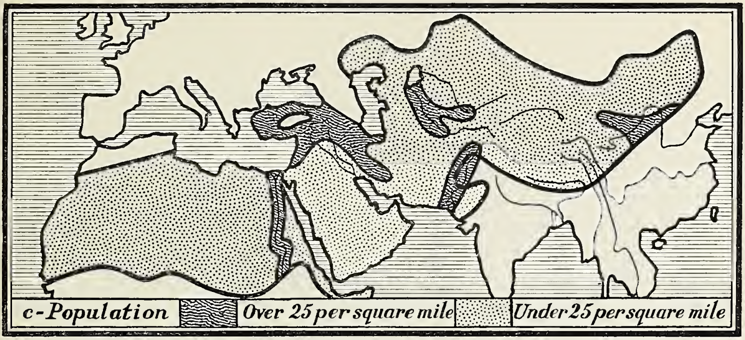
A GREAT desert barrier, 800 miles wide, stretches north-eastwards across the Old World from the west coast of North Africa to the northern borders of China. Except in two regions, where great rivers force their way across the desert, the population is scanty. It consists of two types: the dwellers in the fertile patches called "oases" and the wandering herdsmen, or "nomads." Neither could well exist without the other, though they are often bitter enemies, for in this land of thirst the owners of a well must sometimes fight to keep it.

Across this long desert strip lies a second barrier of highlands from Asia Minor to the Himalayas, dividing the desert into two wings. The western includes the Saharan and Arabian table-


EUROPE
SIBERIA
The Desert Band of the Old World
CHINA
INDIA
Monsoon Asia
a - The Desert Band
North-Eastern Basins of Central Asia
Aral-Caspian
Mongolian
Tarim
Central Barrier of Highlands
South-Western Tablelands of the Sahara and Arabia
b - Sub-divisions

The Desert Band of the Old World and its Sub-divisions. The desert band stretches from the Atlantic far into Asia. The lower map shows how this long belt is divided up.

lands inhabited by white people who speak mainly Arabic; the eastern, in Central Asia, is broken up by massive mountain ranges into a chain of three basins, whose people belong to the yellow race and speak many languages. So the desert has

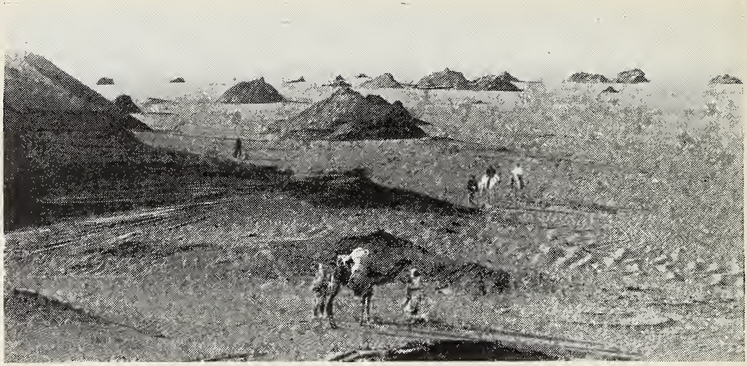


The Distribution of Population over the Desert Band. The greater part is very scantily peopled by roaming herdsmen, camel-men in the western wing, horsemen in Central Asia. The only densely peopled regions are in scattered blocks. These may be where irrigation is possible, as along the Nile, Indus and Amu Rivers, or where rain and grass are more plentiful, as in Turkey and Western Persia.

three forms: the western tablelands, the central highlands, and the eastern basins.

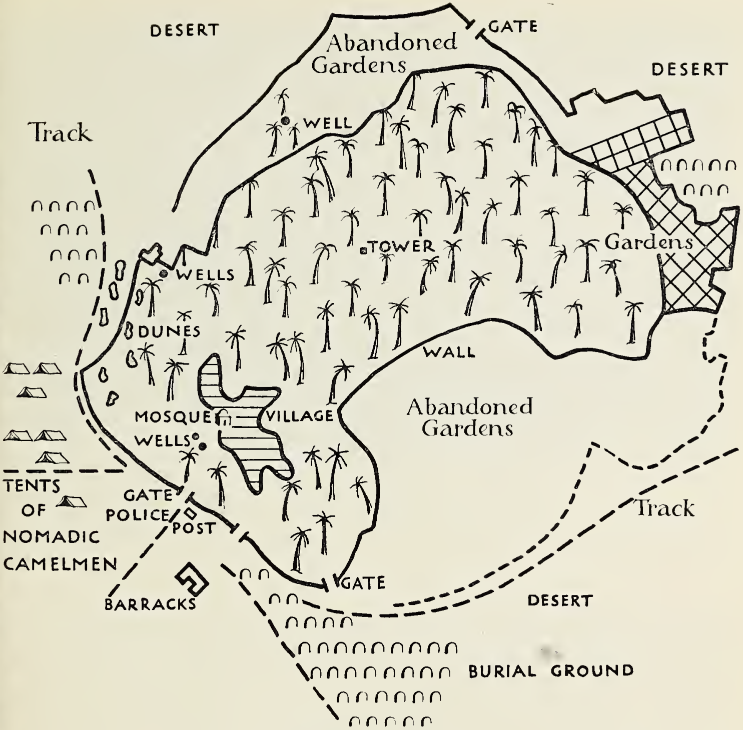
When we speak of a desert, we naturally think of the Sahara —and probably think wrongly. The common idea of a sea of sand-waves, piled by the wind, is true if we approach it from the Mediterranean or the Nile, as most men have done in the past, but the greater part consists of rocky mountains and dry valleys. Some of the ranges, half the height of the Alps, have sufficient rainfall—and even snow—to nourish grass-lands and fill with trees the valleys between. In such places live large tribes of little-known people with populous villages. But the lack of surface water leaves most of the Sahara a brown and yellow desert.

If, however, surface water is lacking, there are sometimes large underground supplies, and on these the green oases are found. Though the oasis-dweller is an expert well-sinker, his



The Sahara near the Oasis of Ain Salah. The photograph shows how the rocks are fretted and smoothed by wind-driven particles. The sand here is spread out in ripples like those of a seashore. The clayey hillocks beyond the men are the last remains of the mud walls of an abandoned oasis.

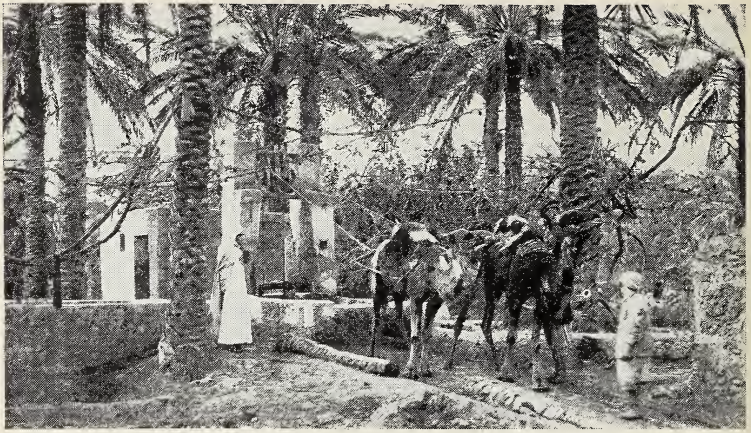
bucket must make many journeys to supply all the water he needs. Some villages rise up rocky slopes; others line valley floors with their rows of palm trees; others again must carry on a constant fight against the shifting sand-dunes. Most oasis-villages are mud-built with winding alleys and flat-roofed houses. Here and there rises a watch-tower or the dome of a mosque, for nearly all these desert peoples are Mohammedans. And beside every village droop the fronds of the palm trees, for life in the Sahara depends upon the date. The oasis in the plan on page 151 is about a mile long. The wells which supply water for gardens and date-palms are shown. The tower is a look-out place to watch for possible enemies. The village of flat-roofed mud huts is small; space is so valuable that the " streets " are merely narrow alleys, and burial grounds are outside. The line between oasis and desert is sharp. Outside the present oasis are gardens aban-


DESERT
GATE
Abandoned Gardens
DESERT
Track
WELL
TOWER
Gardens
WELLS
DUNES
WALL
Abandoned Gardens
MOSQUE
VILLAGE
WELLS
TENTS OF NOMADIC CAMELMEN
GATE
POLICE POST
Track
GATE
BARRACKS
DESERT
BURIAL GROUND

Plan of an Oasis.

doned owing to drifting sand, and the tents of wandering camel-men who have camped near to obtain, perhaps, water, barley and dates.

The date-palm is a native of North Africa. Its bunches of brown fruit are the bread of the desert. Its spreading branches



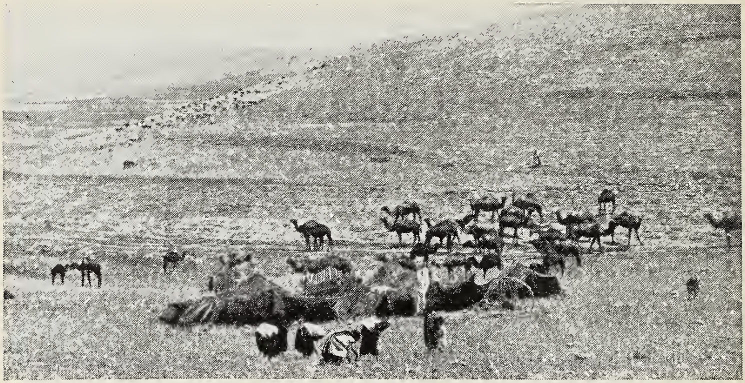
The Oasis of Ghardaia. Sometimes the water emerges as a natural spring, sometimes it has to be dug for. When the well is shallow the water may be lifted by hand; where the well is deep, animals—camels or donkeys—are used, moving down an incline as they pull up the filled leather bucket. The water is poured into the stone troughs and distributed thence to irrigate the date-trees and gardens.

shade men's eyes and gardens from the pitiless sun, and its straight trunk is the only timber of the oases. Thanks to the date-palm the larger oases have become permanent homes and busy markets ; whilst the smaller are way-stations on the desert crossings. Because water is precious in the settlements it has created, there has to be strict control to prevent waste and secure proper distribution of the supply. In some cases near the northern margin the French have sunk many artesian wells so that more water is available; date-trees have been multiplied and there is a surplus of dates for export to Europe.

Unlike the deserts of the southern hemisphere, the Sahara has been influenced by surrounding civilisations. The camel

The Fruit of a Date-Palm. The bunches of glossy brown fruit hang just below the foliage. Dates are the bread of the desert, food for man and beast. A man's wealth may be reckoned by the number of trees he owns. The picture was taken from the top of a nearby palm.

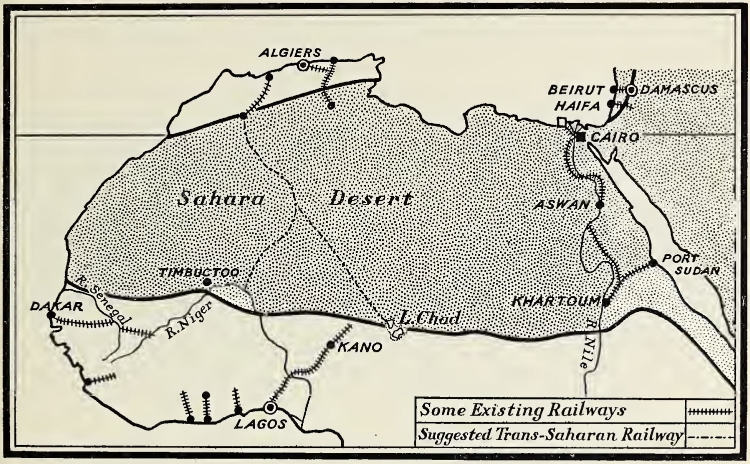
was domesticated early in Arabia, and we find it in the story of Joseph and the Ishmaelites. From their own country the Arabs introduced it into the Sahara about a thousand years ago and thereby brought about the first great change in the ancient ways of life in that region. For the camel, whose spreading, padded feet are wonderfully fitted for travelling over sand, made rapid movement possible. Not only can it go for a week or longer without water and browse on camel-thorn or other desert plants, but a she-camel gives milk for ten months in quantities sufficient to support a man as well as her calf. A camel-owner can therefore wander where others dare not venture.



A Nomad Camp in the Algerian Sahara.

The nomad camp in the picture on this page is on the southern slopes of the Atlas Mountains. Moisture seems more plentiful, for there are more plants growing in the stony soil. Flocks of sheep are feeding on the slopes. In the foreground is a herd of camels and their calves, and a Bedouin encampment. The tents consist of two uprights and a ridge pole over which blankets are thrown. The ends are generally left open to allow air to blow through for coolness' sake.

The camel-men and the peoples of the oases use the desert in different ways; but each needs the other, and their lives are bound together. The camel-men need dates and water; the oasis-dwellers, news and merchandise. The camel-men are restless, and because they could move quickly, they became masters not only of the caravan-routes but of many oases too. They became the desert carriers, but they turned also to raiding tribes and oases richer than their own. They raided even the settlements beyond the desert, vanishing again with their


ALGIERS
BEIRUT
DAMASCUS
HAIFA
CAIRO
Sahara Desert
ASWAN
PORT SUDAN
TIMBUCTOO
DAKAR
R. Senegal
R. Niger
L. Chad
KHARTOUM
R. Nile
KANO
LAGOS
Some Existing Railways
Suggested Trans-Saharan Railway

Some Railways from the Coast towards the Desert Margin. European nations have built railways to help to keep peace in the desert. The broken line, like an up-turned **Y** across the Sahara, shows the suggested routes for a railway across the Sahara, branching to the bend of the Niger and to Lake Chad.

booty where no man could pursue. The camel-men, in fact, became a nuisance and a danger to more civilised regions.

The efforts of Europeans to crush them brought the second great change in Saharan life. The desert was no longer to be a law to itself, but must submit to control from outside. Railways such as those from Beirut to Damascus, or from Cairo towards Khartoum, were built from the coast to the edge of the desert. Native police, trained and armed with modern rifles, were stationed far in the interior at posts well supplied with water by the new methods of deep boring. In some oases the French have deepened the wells and by this means doubled the date crop. Firm control has brought many benefits to the desert. More recently the motor-car and aeroplane have been brought into use, and the airman has been described as the greatest civiliser the desert has ever known.

This control from outside by the holders of the desert borders, Spanish, French, Italian and British, has suppressed raiding, checked quarrels between the tribes and abolished the desert slave-traffic. But a third great change in the Sahara must sooner or later follow when, by railway, motor-car or air, the French link up their three groups of possessions into one vast North African Empire, and the desert that for thousands of years has barred the entry into Africa from the north will be a barrier no longer.

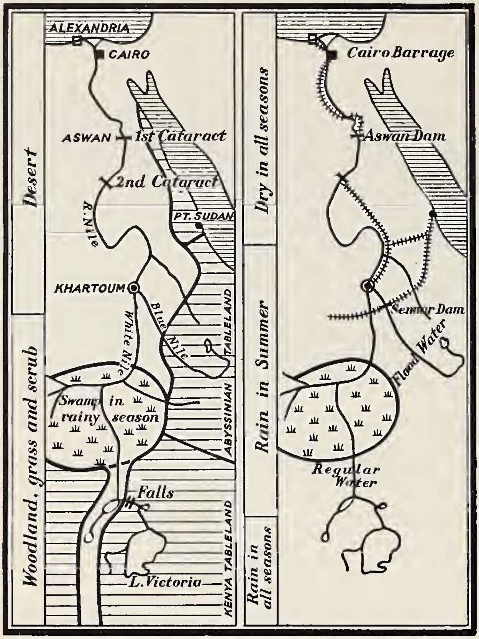
The Swamps of the Upper Nile. As the Nile flows across the grass-lands of the Sudan its gradient is less than two inches per mile. In the rainy season, therefore, the river is unable to carry forward the extra supply of water and overflows its banks.

CHAPTER 20

THE LANDS OF THE NILE

THE Sahara, not the smaller southern area known as the Kalahari, is the best example of a desert region, for its people, so long in contact with the civilised nations on its borders, are far in advance of the poor Bushmen hunters of South Africa. Yet neither the wandering camel-men nor the settled oasis-dwellers can make much progress. For a higher type of civilisation within this desert area we must look to the valley of the Nile.

Most desert rivers, however strong their flow at first, lose themselves at last in the sand. But the Nile, fed by the great rains and lakes of the equator, wins through across the whole

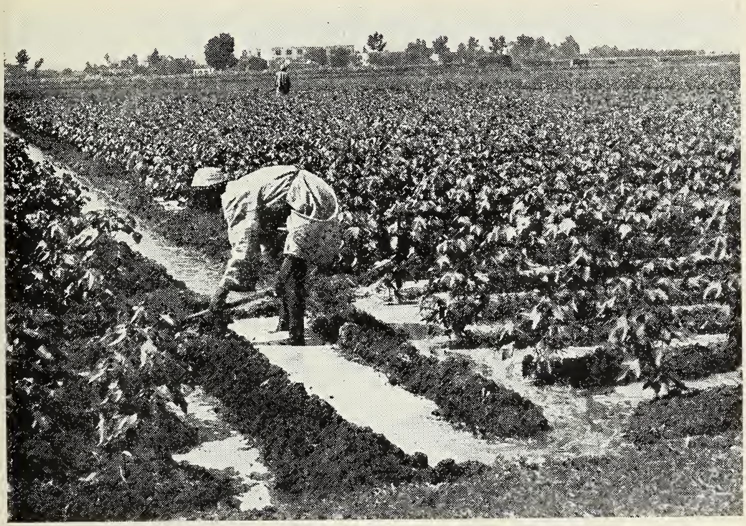

ALEXANDRIA
CAIRO
ASWAN
1st Cataract
2nd Cataract
R. Nile
PT. SUDAN
KHARTOUM
White Nile
Blue Nile
Swamp in rainy season
Falls
L. Victoria
ABYSSINIAN TABLELAND
KENYA TABLELAND
Desert
Woodland, grass and scrub
Dry in all seasons
Rain in Summer
Rain in all seasons
Cairo Barrage
Aswan Dam
Sennar Dam
Flood Water
Regular Water

The Lands of the Nile.

The left-hand map shows that the Nile rises in Lake Victoria, tumbles off the high tableland (shown by horizontal lines) into the Rift Valley, and then, after flowing across a swampy basin, crosses the desert to the Mediterranean.

The right-hand map shows that Lake Victoria and other lakes supply it with water all through the year: the flood-water comes from high Abyssinia down the Blue Nile in late summer.

width of the desert to the Mediterranean. Its source is in Lake Victoria on the Kenya Tableland. Dropping by falls and rapids into a deep valley, whence it receives the waters of Lake Albert and other lakes, it flows out through the marshes and grass-lands of the Sudan northwards to the desert near Khartoum. In this middle stage it is known as the White Nile, though its waters are a clear, greenish grey. At Khartoum the largest of its Abyssinian tributaries, the Blue Nile, joins it on the right. Two hundred miles further north the last tributary has been gathered,

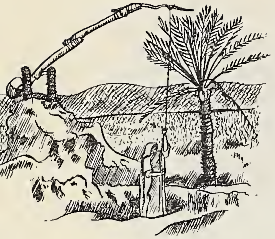


Cultivating Irrigated Cotton in Egypt. The young cotton plant is set along ridges so that the water does not stand about the roots, and irrigation water is led into the intervening ditches, as seen in the picture. The worker with the hoe has just blocked the main channels to turn water into those that lead off at right angles.

and from that point the river flows for 1,600 miles with no further supply, shrinking but unconquered, to the sea.

The White Nile, with its vast lake-reservoirs, supplies the regular water, the Blue Nile adds most of the yearly flood. From July to September the mountains of Abyssinia are drenched with tropic rains. The run-off, scouring the surface of the rich volcanic soils, pours chiefly into the Blue Nile, turning its waters to chocolate brown and completely overmastering the White Nile when it joins it at Khartoum. This muddy, fertilising flood is the life-blood of Egypt.

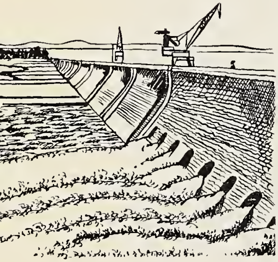
Towards the end of July, the news is one day flashed down



HADUF OR BUCKET LIFT.

the valley that the river has begun to rise. Eagerly its course is watched. The water-level creeps up the banks, the current quickens, the colour darkens, until, by the middle of August, the river is flowing bank high and swirling wildly under the Cairo bridges.

The old-fashioned method of using the water is to lead it through sluices into the low-lying fields when the flood is at its height. There it remains till the ground is soaked and the fertilising mud has settled. After about six weeks the clear water is drained off again into the falling river, and grain and vegetables are sown to be harvested in the following spring. Only one crop a year can be grown by this method except close to the river-bank, where water can be raised from the dwindling river by bucket-lift, water-wheel or steam-pump.



ASWAN DAM.

But the building of dams has introduced a better system. The largest is at Aswan just above the last[1] rapids or "cataract." No attempt is made to stop the flood at its highest, which passes down to fertilise the fields below, but directly the Blue Nile water subsides, the sluices are partly lowered till the imprisoned river forms a narrow lake 200 miles long. In the spring this water is passed on to the farmers below, who use it largely to grow some of the world's finest cotton. A more recent dam on the Blue Nile (see map, p. 158) controls the water for the irrigation of cotton fields in the Anglo-Egyptian Sudan. The railways to the Red Sea carry the bulky cotton bales for export from Port Sudan, while the cotton of the delta in Egypt

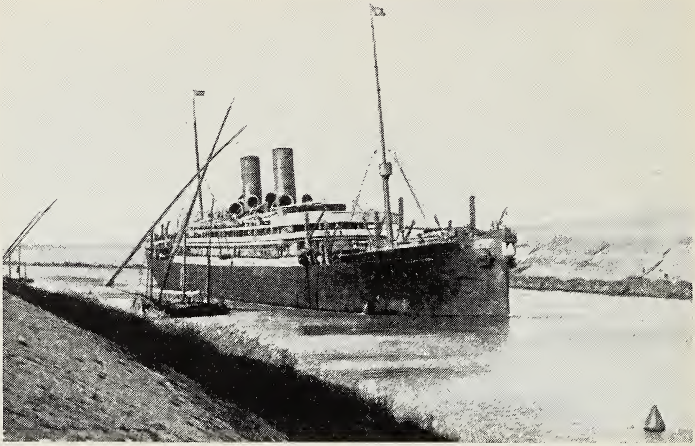
[1] Last for the river, but first from the Delta.

Cairo. The picture shows what an eastern city looks like. With no rain, roofs are flat, except the round domes and tapering minarets of Mohammedan mosques, which rise above the general level. In the right background the walled citadel rises conspicuously with the main gate in the left centre of the photograph.

goes out through Alexandria. Thus the old division of the year into winter (dry and cold), summer (dry and hot) and "Nili" (flood-time) is largely out of date.

At the head of the Delta an older dam recently rebuilt turns the water into irrigation ditches which make this "gift of the Nile" one of the most fertile regions of the world and particularly rich in its cotton crops. Here, and here only, is there any reliable rain, and that occurs in winter. Were it not for the Nile the rest of Egypt would be as much a desert as the Sahara. Nowhere above the Delta is the fertile area more than 50 miles wide.

The building of the dams has done more for Egypt than

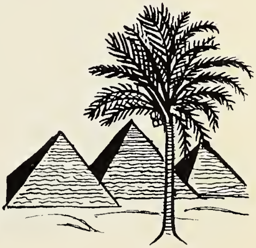


The Suez Canal. The photograph shows the bare sandy banks of the canal. A steamer is moving slowly along the waterway lest her "wash" should bring down the sand and fill up the channel.

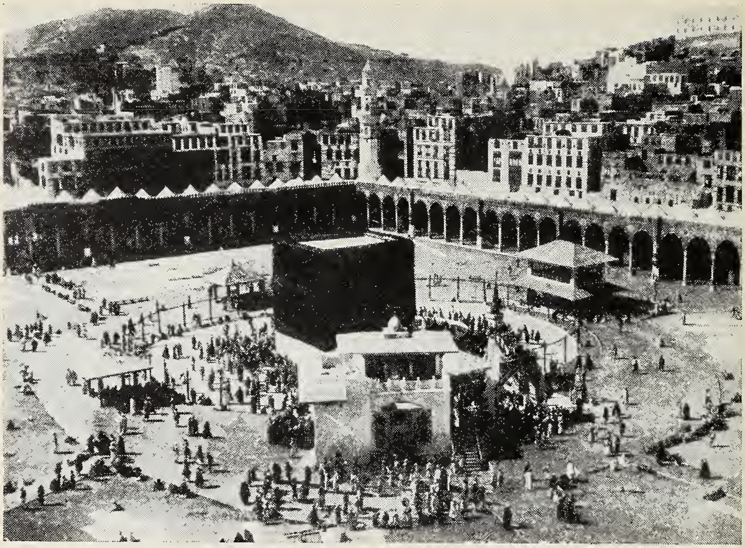
to make her, through her port of Alexandria, the third greatest cotton exporter of the world. It has saved her from the famine which threatened her in the past whenever the flood was insufficient. But with ample water and better government the population has doubled, and the land is divided into holdings so small that more than a million families have to live on the produce of an acre or less apiece. The desert peoples have small cause to envy the lot of the Egyptian peasant farmers.

Under its deep blue skies and brilliant sun the green land of Egypt winds southward, bisected by the paler green or dark brown of the river and bounded by the yellow rocks of the naked valley walls. Beyond them lies the desert, securing the land against serious attack. But its complicated water system needs firm government, and for such control the point where valley and delta meet is the best position. Cairo is therefore the natural capital. It is the biggest city in Africa. The newer quarters resemble a European city, but the older town is full of winding lanes and busy bazaars with separate districts for Mohammedans, Jews and native Christians. Recently Cairo has become the air-base for the desert crossing to Bagdad and the east, as well as for the southern route to Kenya and Capetown.

A hundred miles east runs the Suez Canal from Port Said to the Red Sea. The men who work it depend on the Nile for their drinking water, which is brought from Cairo by the "sweet water canal." This follows in places the line of a waterway, long since destroyed, joining the Red Sea to the Nile and the Mediterranean 3,000 years before the Suez Canal was built. The Suez Canal runs at sea-level without locks, so forming a genuine water-barrier between Africa and Asia, the continent to which we now turn.



PYRAMIDS.



Mecca. The chief attraction is a great Mosque, consisting of a large quadrangle capable of holding 35,000 people, surrounded by domed cloisters supported on decorated arches and slender pillars. In the centre stands the Kaaba or Holy of Holies. It is covered with rich hangings. The pilgrim walks round the Kaaba seven times and kisses the " Black Stone " which is in one of the walls.

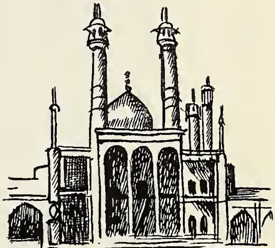
CHAPTER 21

EAST OF SUEZ

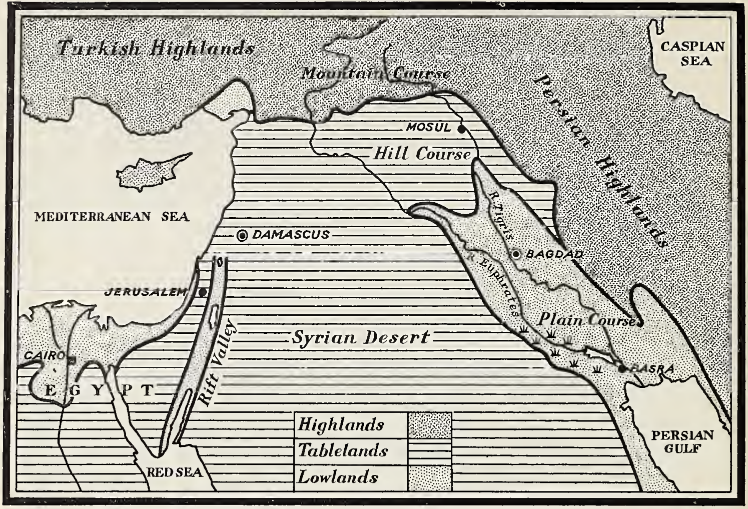
OF the three continents of the Old World, Africa gains least from the Suez Canal; for Capetown it means an actual loss. But to Europe and Asia the advantage is enormous. In Asia, half the population of the world provides what another quarter, in Europe, urgently wants: food-stuffs, materials for manufacture, and markets for the manufactured goods. Between the two stretches the desert barrier, across which only occasional caravans made toilsome and dangerous journeys. The discovery of the sea-route round Africa made traffic easier and even cheaper, but still unprofitably slow. Three-quarters of a century ago the barrier was pierced at its narrowest part by the enterprise of French engineers, but of all nations Britain has been the greatest gainer. More than half the 5,000 vessels that pass yearly through the Canal are British, and for the security of our eastern empire those ninety miles of waterway are all-important.

The waters of the Red Sea are no more than a brief interruption of the desert. The great block of Arabia is tilted up on the south-west and slopes gently towards Iraq (Mesopotamia). A few broad valleys in the mountain rim break down to the Red Sea, but neither here nor elsewhere are there any permanent rivers. In one of these valleys lies Mecca. Mecca is one of the oldest cities of Arabia, and is the Holy City of the Mohammedans and their greatest centre of pilgrimage. It is full of lodging-house keepers, guides and attendants. The streets are wide but dirty, as there is no drainage system. As shown in the picture, the flat-roofed houses are often many stories high and climb up the barren hillsides. The most fertile and populous region lies in Yemen, south of Mecca, the highest corner of the land, with rain and heavy mists in summer.

A native proverb declares that Yemen is the cradle of the Arab race and Iraq its grave, but this does not mean that its progress is all downhill, nor are all Arabs buried in Mesopotamia. It expresses the historic truth that out of Arabia wave after wave of conquerors has invaded the fertile lands that bend, like a horseshoe, round the desert from Palestine to the Persian Gulf. From before the days of Abraham the wandering Bedouins (the "desert-dwellers") have raided and driven out the cultivators of this "Fertile Crescent," giving up their nomadic life for that of settled farmers.



Mosque.


Turkish Highlands
Mountain Course
CASPIAN SEA
Persian Highlands
MOSUL
Hill Course
MEDITERRANEAN SEA
DAMASCUS
R. Tigris
BAGDAD
R. Euphrates
JERUSALEM
Plain Course
Syrian Desert
CAIRO
BASRA
EGYPT
Rift Valley
Highlands
Tablelands
Lowlands
PERSIAN GULF
RED SEA

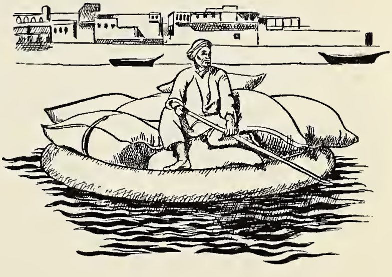
Surface Divisions and Rivers of Iraq. The map shows how the plain of the Tigris and Euphrates lies between highlands on the east side and the desert on the west, from both of which it has been invaded again and again.

Iraq or Mesopotamia, the "land between the rivers," is the second case we meet of rivers that defeat the desert, but here there are two of them, and the distance to be covered only half the desert journey of the Nile. The Tigris and the Euphrates are as important to Iraq as the Nile is to Egypt, but they are more difficult to control. The two rivers rise and run together in the mountain region of the north and break through in wild gorges far apart. They then flow through hill country, gradually drawing nearer together, until at Bagdad (the capital) they are only thirty miles apart. Thereafter they flow through a flat plain, part of which is swampy, with rice fields and date-groves, to unite in the delta which they are pushing down the Persian Gulf. The melting snows of their mountain course bring floods in early summer, but since their currents are swifter than the Nile's, and the mud coarser (though even richer), they often choke the irrigation channels instead of fertilizing the land. Every peasant is said to carry two weapons when he visits his fields—a spade to clear his ditches and a rifle to ward off raiders.

Iraq is more open to attack than Egypt. It lies broadside to both the Persian highlander and the Arabian nomad, and between the two an age-long struggle has raged for the possession of the rivers. After the Great War Iraq became a mandate in Britain's charge. Now it is independent, but the danger from desert raiders has by no means passed.

Most of its inhabitants live in the middle region, where the two rivers come close together. Here the capital has always lain, from the days of ancient Babylon on the Euphrates to those of modern Bagdad on the Tigris. Above Bagdad the rivers flow through rolling grass-lands grazed by horses, sheep and goats. In this region oil is now being extracted. Below the city, fens and flats begin, the delta built out by the rivers into a once longer Persian Gulf. Here, in one of the hottest corners of the world, rice-swamps and date-groves border the water-courses, and nearly half the dates that enter into world trade are exported from Basra.

Syria and Palestine form the left half of the "Fertile Crescent." Together they cover the Mediterranean coast from Asia Minor to Egypt, and are mandates respectively of France[1] and Britain, neither of whom finds control easy. The highlands of Judæa and Lebanon receive sufficient rain from the westerly winter storms, though little



Raft of Inflated Skins.

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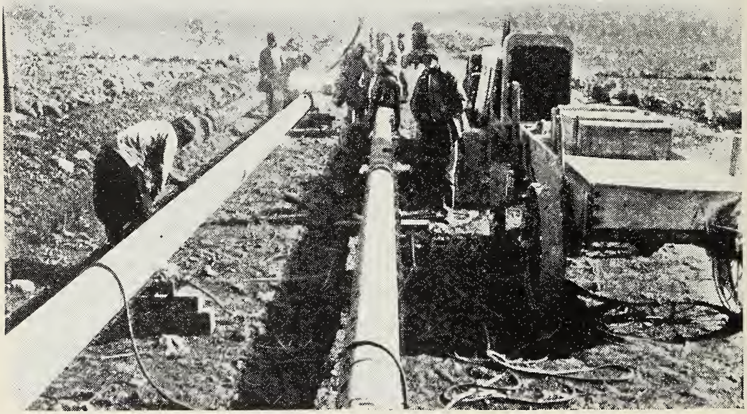
[1] But Syria will soon be independent, like Iraq.



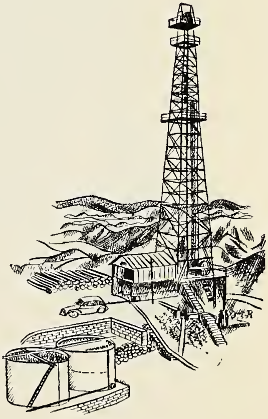
Pipe-Lines across the Desert of Arabia. The pipes have been laid from the oil-wells of Iraq along the foot of the Persian Mountains to the ports of Haifa in Palestine and Beirut in Syria. They are buried in the soil to protect them from raiding Arabs, but the protection is sometimes ineffective.

reaches the desert or Iraq beyond it. Orange groves cover the lowlands about Jaffa, and Syrian Lebanon is clothed with coniferous forests, though the famous cedars are now rare.

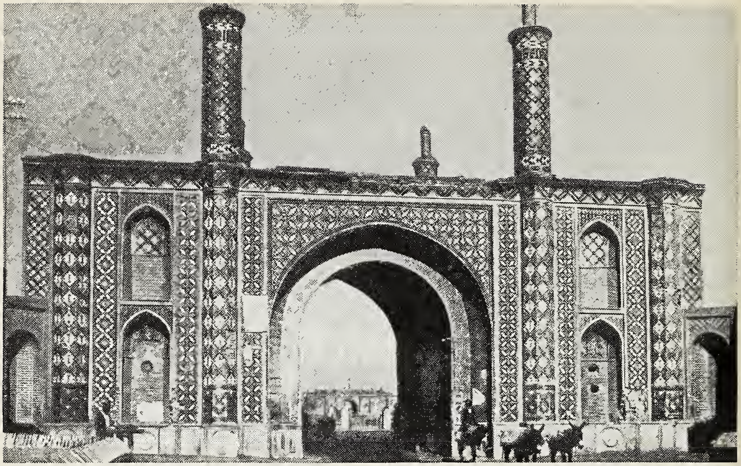
The whole region, like Iraq, is exposed to the desert, and has often been invaded by the desert dwellers. Even the Jews were originally a desert people. In modern Palestine the Mohammedan Arabs far outnumber them, even with the European Jews who have settled there since the War, and there is bitter hostility between the two religions.

The ancient highroad between Egypt and Mesopotamia runs along the coastal plain, then inland to Damascus and the Upper Euphrates. Jerusalem, the capital of Palestine, was built purposely away from it and today would be a mere hill-top village but for its importance as the ancient home of the Jew, the cradle of Christianity and the second holy city of the Mohammedans.

Damascus is the capital of Syria, but the task of pacifying this wild region is scarcely yet completed. A railway connects Damascus with the port of Beirut, and a branch from the "Pilgrims' Railway," which skirts the desert nearly as far south as Mecca, follows the coast to Cairo. Other means of conquering the desert barrier are being developed. The air service from Cairo to Bagdad and India has already been mentioned, and a pipe-line across the desert now delivers the oil of Iraq to Mediterranean shipping at Haifa in Palestine and Tripoli in Syria.



Oil Derrick.



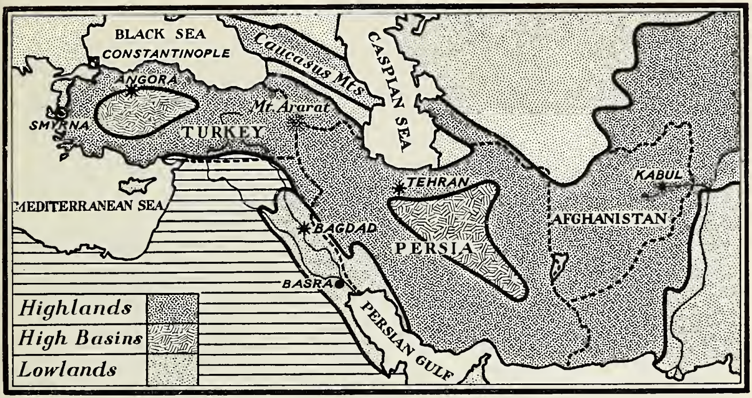
A Gate of Tehran. The gate is solidly built and elaborately decorated with coloured tiles. The decoration is not in the natural forms of plants and animals, but consists of geometrical patterns. The colours are bright, with blues and greens conspicuous. Some pack-donkeys are seen in the foreground.

CHAPTER 22

TURKS, PERSIANS AND AFGHANS

TWO highland regions separate the south-western from the north-eastern wing of the desert barrier. They have the form of plateaus, areas which might be described as *billiard*-tablelands, for their high inner surfaces are surrounded by yet higher mountain ranges with pocket-like passes to the outer world; but the inner surface is by no means smooth. The plateau of Asia Minor is occupied by Turkey, and the Iranian plateau east of it includes both Persia (now called Iran) and Afghanistan.

Arab Smoking a Hookah.


BLACK SEA
CONSTANTINOPLE
Caucasus Mts
CASPIAN SEA
ANGORA
SMYRNA
Mt. Ararat
TURKEY
MEDITERRANEAN SEA
TEHRAN
KABUL
AFGHANISTAN
BAGDAD
PERSIA
BASRA
PERSIAN GULF
Highlands
High Basins
Lowlands

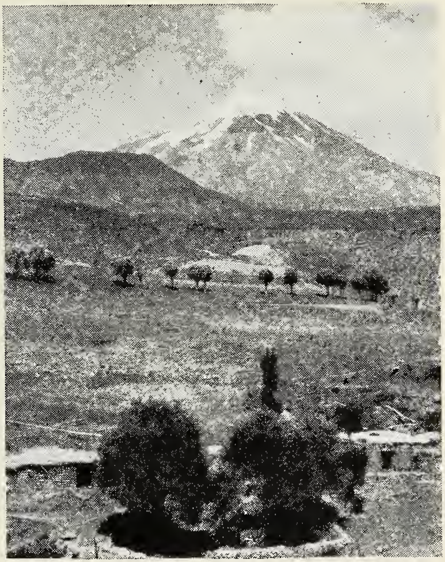
Surface Divisions and States of the Western Asian Plateaus. Compare with the map in the atlas. The map shows the boundaries and capitals of Persia, Turkey, and Afghanistan, the three states which cover these high plateaus. Both Turkey and Persia consist of high dry basins surrounded by towering mountain ranges.

Each plateau, shut off from the winds of bordering seas, is hot in summer and cold in winter, with cloudless skies for most of the year. Each is therefore dry, though the dry core in Asia Minor is comparatively small, owing to the winter rains from the seas that enclose it on three sides. Within the mountains little but thin grass can grow; much of the rest is sand-dunes and salt deserts. Herdsmen roam from pasture to pasture feeding their goats, sheep or camels wherever they can. From the wool, coloured with the vegetable dyes of the more fertile districts, are made the rugs for which all these highland regions are famous.

The mountain edges are watered by winds from the sea, and down the outer slopes many rivers return to it; but the inward drainage dwindles or finds its way into some depression,

Smyrna is the old name of a very old city, now called Izmir by the Turks. The city itself rises up the steep sides of its bay. The houses have low-pitched roofs; the walls are white and plain, and no chimneys are needed.

where it forms a shallow salty lake, varying in size with the season and supply. In the oases watered by these streams the towns and villages of the settled population are found. The old struggles between the nomads and the stay-at-home cultivator go on here as elsewhere, but the houses outnumber the tents, and a central Government holds the wandering tribes in check. Control from within—not, as in the Sahara, from outside—aided by European ideas and inventions, is gradually changing disorder to order, but the resistance is greater as the distance from Europe increases. The Turkish Government has now adopted the European alphabet and costume and started a modern system of education. Railways and tractors, motor-



Mt. Demavend, the cone of an extinct or nearly extinct volcano, is the giant of the Elburz Range, which separates the dry steppes of the interior plateau from the forests and swamps of the shore of the Caspian Sea.

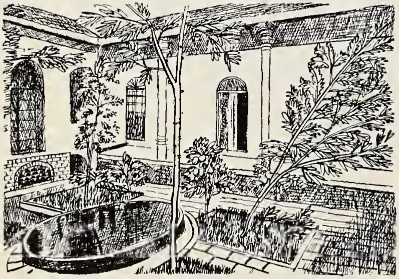
roads and aeroplanes are changing the habits of centuries. Similar means are being applied, though more cautiously, in Persia; but in Afghanistan a too sudden introduction of new ideas cost one ruler his throne. Hardly a railway and few motor-roads have yet been built, but the warlike Afghans have welcomed the latest weapons, including aeroplanes.

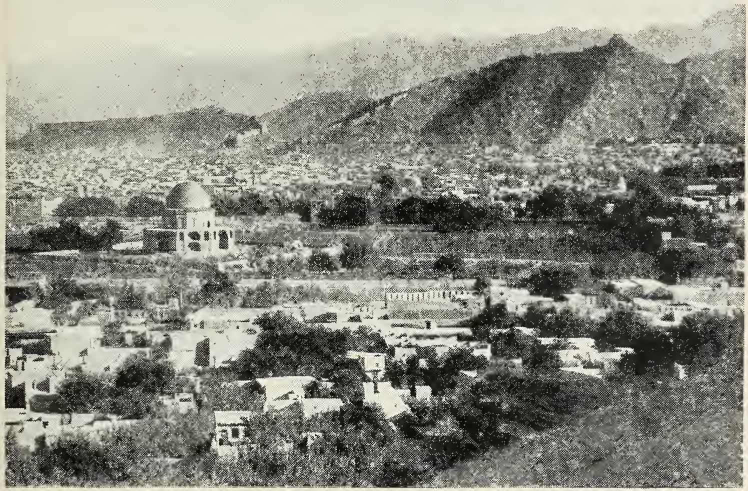
In each country the population is of three types: the wandering herdsmen, the village peasant farmers, and the townsmen. These last are mainly Government officials, landowners living on their rents, merchants and craftsmen. The towns are often walled against attack, and from the open country the traveller passes straight into the crowded streets. Along the narrow ways of the covered bazaar, merchants expose their goods in open shops, and weavers and silversmiths ply their crafts for all to see. Behind the forbidding walls of the larger houses trim gardens with almond and cypress trees, refreshing pools and cool verandahs relieve the heat of summer, but the cleansing of the cobbled streets is too often left to kites and crows and ownerless dogs.

Both Turkey and Persia extend beyond their mountains to the coast. Along the Black Sea lie Turkey's chief tobacco fields, and down the fertile valleys that slope to the Ægean grow the figs and raisins she exports from Smyrna. The port outstrips all rivals along the coast owing to two facts. First, no river is filling up the head of its bay with silt, and it therefore remains a deep-water harbour, while other ports are choked. Secondly, three large river valleys lead railways down from the interior to meet here. Once Turkey possessed all South-Eastern Europe, but now she retains little beyond the shores of the Straits. Istanbul (Constantinople) on the Bosporus was long the Turkish capital, but the Government is now centred at Ankara (Angora) on the northern edge of the plateau.

Tehran, the Persian capital, is similarly placed, convenient for control and well supplied with water brought underground from the Elburz mountains on the north. The superb snow-capped cone of the dead volcano, Demavend, always in view, reminds the inhabitants, sweltering in the summer heat, of their cool mountain retreats. North of the Elburz, the rainy Caspian coast supplies all the country's timber and the rice that figures in every Persian meal. Westwards towards the Turkish frontier the country rises in rolling grass-lands. Over most of the country wheat and barley are winter crops, often dependent on dry-farming methods, but also grown on irrigated lands. Modern agricultural machinery is now replacing the old wooden ploughs drawn by bullocks or donkeys. But corn is still often reaped with a sickle, to be trodden out by the same beasts on a threshing-floor.

Opium is grown for export to the East, but nearly a tenth of the


A Persian Garden.



Kabul. The general view shows the contrast between the surrounding rugged mountains and the flat-floored basin of the Kabul River, between the steep bare rocky slopes and the trees of the plain. Houses are built of sun-dried mud, flat-roofed and squat, above which here and there rises the dome of a Mohammedan Mosque.

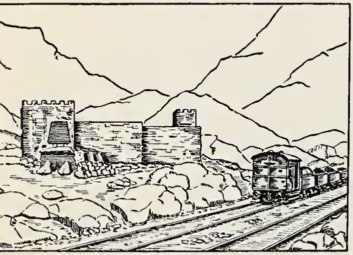
population is said to take this deadly drug. In the south dates are exported, and the oil-fields of the Anglo-Iranian Company are a great source of wealth to the country and its people. A pipe-line to the head of the Persian Gulf secures cheaper shipment to users overseas.

The Persians are a white people distantly connected with those of Europe. They are proud of their literature. Persia's poets are as famous as her roses, and their tales are full of legends of heroes and their wars with the people of Central

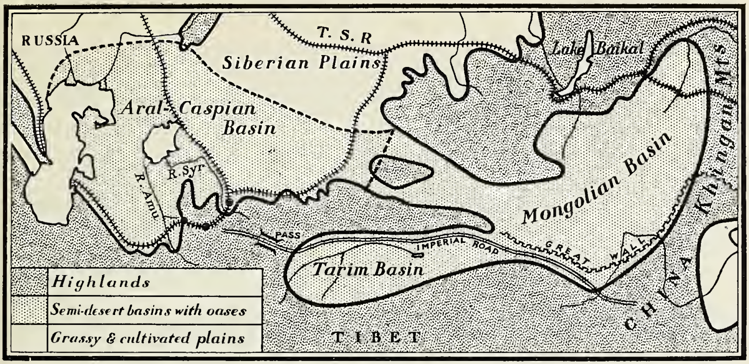
Asia, Persia's ancient foes. One such story, of Sohrab and Rustam, is well known to English readers. To Persia also we owe the games of polo and chess.

The Persian language is also the official language of Afghanistan, and that country gets much of its civilisation from Persia. Afghanistan controls the only routes between Russia and British India. As an independent state, it acts as a sort of buffer between these two states. Its capital, Kabul, commands most of the passes from west and north and east, particularly the famous Khyber Pass which leads into India. The town is pleasantly situated amid beautiful gardens and fertile fields fed by the winter snows, but its streets are mean and ill-kept. Wheat, the chief food-crop, is reaped in spring, but maize, rice and many fruits ripen in the summer heat.

Note.—In 1935 the names of Persia and of her people (but not of their language nor of the Gulf) were officially changed to Iran and Iranian. To avoid confusion the older names are retained in this chapter.



Frontier Station, built like a Fort.


RUSSIA
T. S. R
Siberian Plains
Aral-Caspian Basin
R. Syr
R. Amu
Lake Baikal
Khingan Mts
Mongolian Basin
PASS
IMPERIAL ROAD
GREAT WALL
Tarim Basin
CHINA
TIBET
Highlands
Semi-desert basins with oases
Grassy & cultivated plains

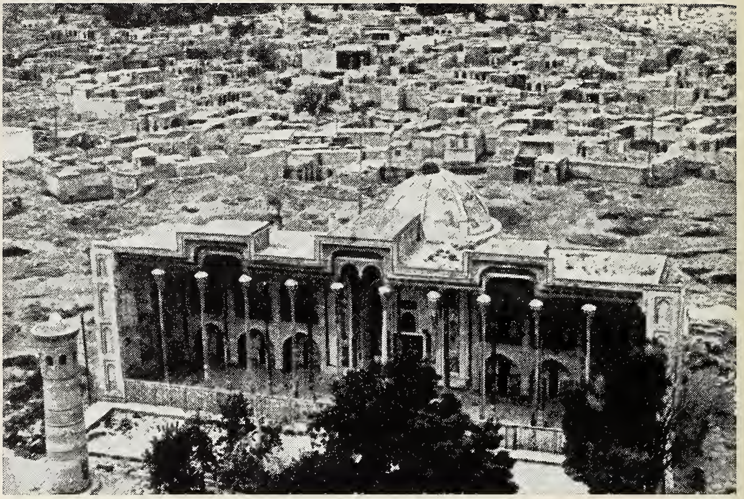
Surface Divisions of Central Asia. Compare with the map in the atlas. The three basins are shown. The old Imperial Road by which Chinese silks once reached Europe can be seen running from oasis to oasis along the foot of the mountains. The diagram also shows the modern Trans-Siberian Railway (T.S.R) and the Great Wall of China.

CHAPTER 23

CENTRAL ASIA

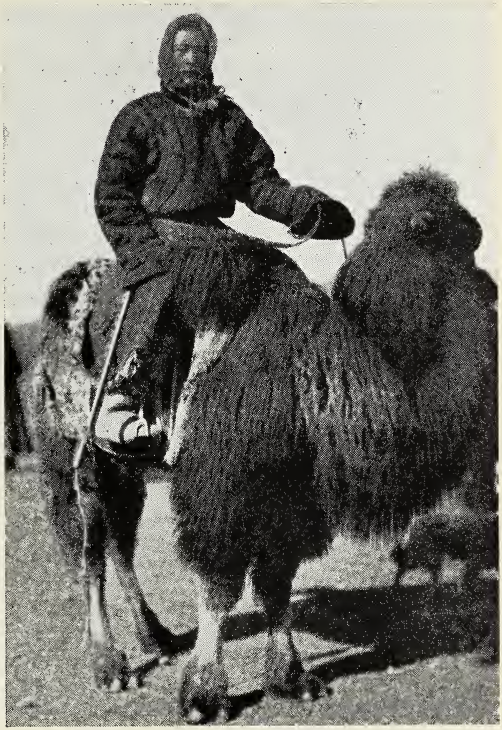
THE eastern wing of the Old World desert barrier reaches from the Caspian Sea to the northern borders of China. It is a series of separated basins, hollower by far than the plateau we have just left. Though hot enough in summer, they suffer in winter from intense cold and blizzards in which animals may perish by the thousand.

The lofty mountain ranges provide summer feeding for flocks and herds, and from their slopes start many torrents that never reach the open plains. Their water is used up in a string of oases along the foothills of the ranges before it can sink into the sand. And here, as in the Sahara, the nomads trade and raid and the oases profit and suffer, till stronger nations from outside bring the lawless tribes to order.



Bokhara. The picture shows, as in Kabul, dwellings one-storey high and made of sun-dried mud, looking like a number of boxes set down in disorder. The houses have flat roofs in this almost rainless country. The monotonous appearance is relieved here and there only by the domes of Mosques like that in the foreground.

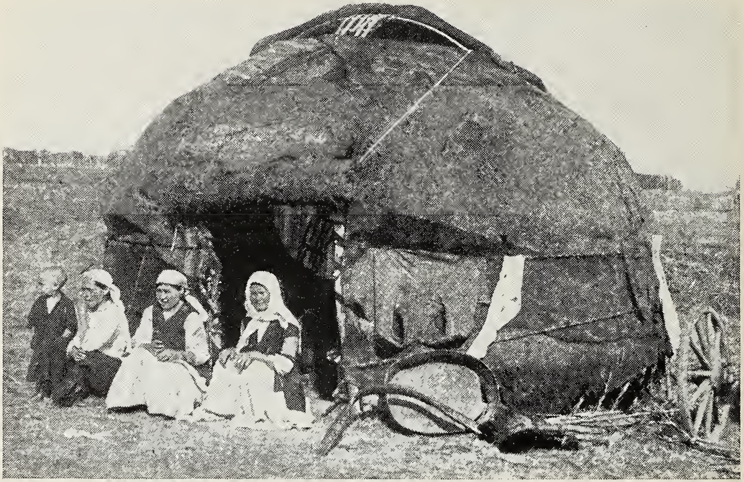
The Aral Basin extends from the Caspian to the mountains of Pamir and northward to the lower water-parting from which Siberian rivers take their water. Only two rivers, fed by the snows of high Pamir, the "roof of the world," win their way to the shallow Aral Sea, making two ribbons of green fertility across the desert sands. The Zarafshan ("Strewer of Gold"), a tributary of the Amu in all but fact—for it never actually reaches it—drains the most fertile valley in the region, where rice and cotton and all kinds of fruit flourish. Two large and ancient cities lie beside it. Samarkand, at the entrance to the plain, is a beautiful and healthy town, half Russian, half



A Kirghiz Nomad on camel-back. Like the Saharan camel-man, the Central Asiatic is a trader and caravan-man as well as a raider of oases or of the fertile desert fringes. Like his beast, the rider is clad against the cold. His shoes are soft and thickly padded; his long sleeves come down well over the hands.

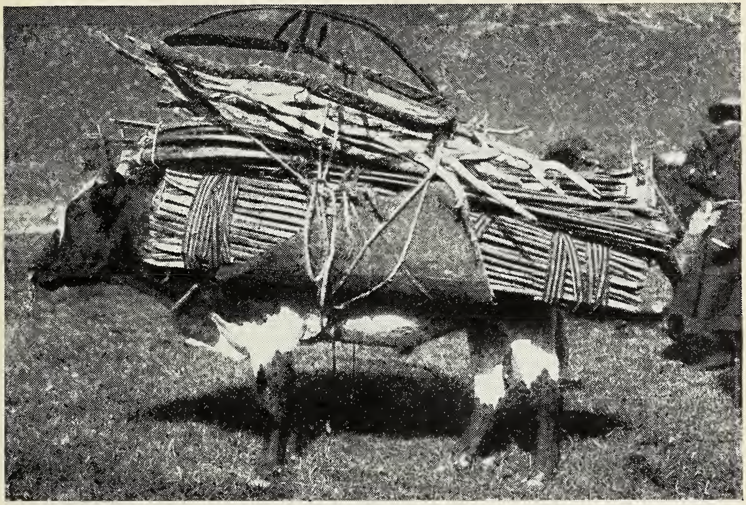
native, and thronged with merchants and craftsmen. Bokhara, in an oasis of the plain watered by the dying river, is a dirty, unhealthy town, but within its eight miles of walls the caravans find their busiest market. It has great traditions of learning and is still a kind of Mohammedan university, though, like the rest of the basin, it is under a Soviet government.

The Kirghiz or Cossacks are the chief nomads of this basin, wandering over the uplands that divide it from Siberia. They are the people of the steppe, the rolling northern grass-land,



A Kirghiz Tent on the Steppes. The tent is supported by a framework of supple woodwork. On this are laid thick mats of felt, made from the wool of the flocks and held down firmly with ropes of hair. The whole can be taken down or set up rapidly by the women and is easily carried on the backs of animals.

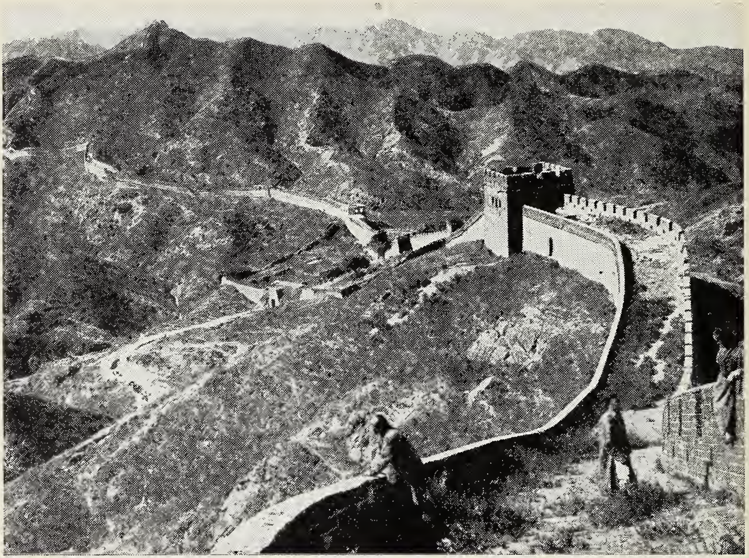
white with snow in winter, green in spring, and brown under the parching summer sun. The steppe was the original home of the horse, and the Kirghiz depend on their wiry native pony, which serves them as the camel (though they have camels too) serves the nomads of the Sahara. The Central Asian, or Bactrian, camel, like its Saharan cousin, has broad padded feet, useful in travelling over sand; but it has two humps instead of one, and the coat of hair is long and shaggy, as a protection against the winter cold. To escape the winter blizzards the Kirghiz drive their flocks and ponies into some



Ox-Transport in the Steppes. The framework of the beehive tent, uprights and circular roof, are here packed up for transport together with some firewood, which is scarce on the treeless steppe. The back and flanks of the animal are protected by a thick piece of felt.

sheltered valley, returning to the open plain after the April lambing and foaling season. When the heat of May begins to wither the grass and dry up all the water, and the flies make life unbearable, the summer trek begins. Some follow the retreating snow up to mountain pastures, while others move north into Siberia, halting wherever there is enough grass and water for their beasts. Then, when the snows return, they move down or south again to their winter quarters.

Their flocks and herds are all in all to them. As with the South African Basutos, their wealth is reckoned by the size



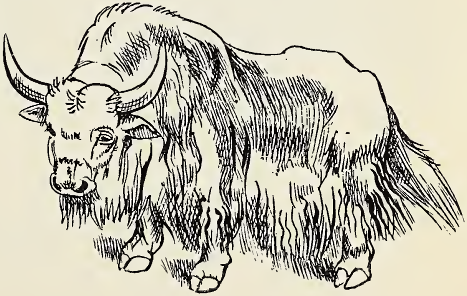
The Great Wall of China varies in height from 20 to 50 feet, and is about 20 feet wide at the bottom and about 15 feet wide at the top. At intervals of about 100 yards are towers, formerly used as stations for sentries or vantage points in the defence of the Wall. Note on the left, the steep uphill approach from the north, or enemy, side.

of their herds—but of sheep and ponies rather than cattle. The food of the Kirghiz is milk, fresh or curdled, and its products, butter and cheese. His tools are largely made of horn or hair or hide, and he wears a woollen coat with extra long sleeves to keep out the winter cold. His snug dome-shaped huts, like gipsy tents, are made of bent willow covered with home-made felt and held against the violent winds with ropes of hair. The whole dwelling is rounded, without corners to wall or roof, so as to throw off the violent wind of the " buran " or blizzard which sweeps unhindered across the level plains. The door is a flap of felt which is rolled up and tied in the day-time. Inside, the furnishings are rugs and cushions.

In the Tarim Basin further east there are oases, but no grass-lands, and therefore no nomads. The region was once better watered than it is today, and through it passed the Imperial Road, the great caravan route which brought the jade and silk of China to the markets of India and Europe. But the southern sea-route and lately the Trans-Siberian Railway have made such caravans unnecessary.

Mongolia, the last of the desert basins, has a centre of rock and sand with thorny scrub and sage-brush, the great Desert of Gobi. Round it lies a fringe of grassy steppe, the home of the Mongolian horsemen against whose raids the Chinese built their Great Wall 1,700 years ago. The Great Wall of China runs in a curve from the mountain mass of Tibet across the great northward bends of the river Hwang to the sea north of Peiping. It is straight nowhere but winds uphill and down dale for the whole of its length. But this did not save China from invasion and conquest, and the history of the Fertile Crescent was here repeated. The desert's wind-swept wastes are crossed by cart and camel caravans bringing Chinese products now to the Russians of Siberia instead of carrying them direct to Europe.

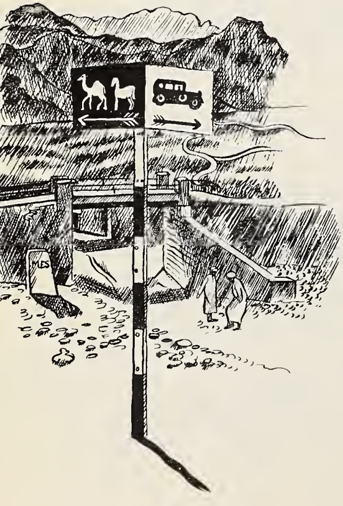
Like the nomads of Arabia, the nomads of Central Asia have streamed out over all the lands that tempted them. They poured their mounted hordes into Europe, Asia Minor, Persia, India and China. Tartars, Turks and Mongols have struck terror into the hearts of peaceful cultivators



YAK.

in more favoured regions, who have seldom been able to drive them out again.

Russia and China, the countries most concerned with the wandering desert tribes of Asia, have been compelled to interfere to put an end to disorder and violence. Their method has been to follow conquest by colonisation. When the farmer arrives with his spade the nomad retreats with his herd, but much of the land is suited only for grazing, and there he can still find a home, if he will not, as many are inspired to do by the colonist's example, take to irrigation and modern methods of farming. Russia's grip is maintained by railways which loop the Aral depression and link up with the Trans-Siberian line. A similar purpose is shown by the railway the Chinese are building from Peiping to the bend of the Hwang Ho in Inner Mongolia.



A Signpost in Central Asia for Natives who cannot read.

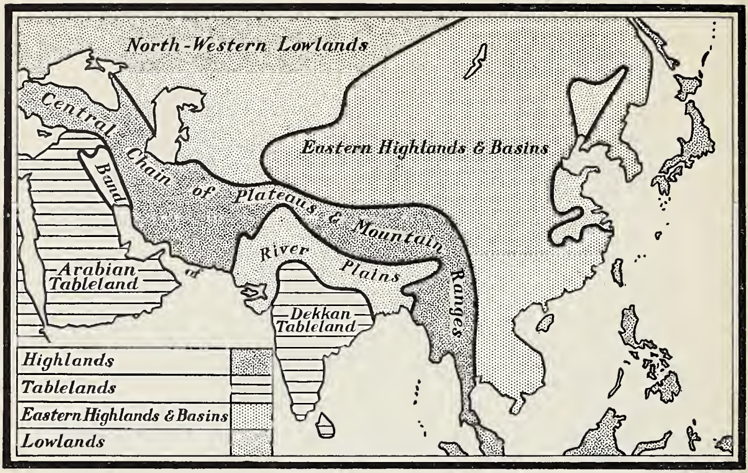
Tibetans. Buddhism is the religion of Tibet. It is estimated there is a monk for every family. The Tibetans are great traders, using camels, mules, and yaks for carrying purposes. The two in the picture are heavily clad against the intense winter cold, and the one on the right is holding a prayer box and string of beads.

CHAPTER 24

THE WINDS OF ASIA

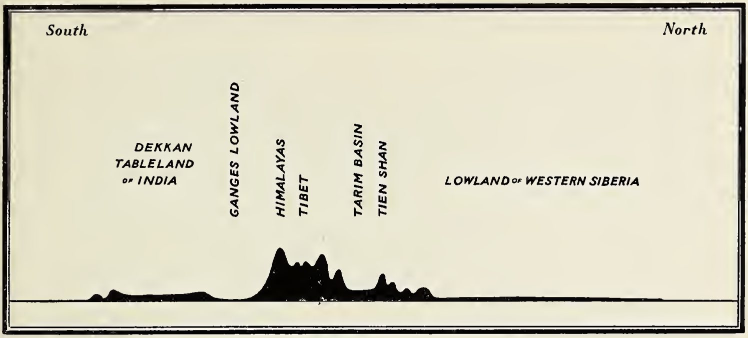
WATER is warmed by the sun's heat much more slowly than the land, and when that heat is feeble, as it is in winter, water turns cold more slowly than the land. So in a small island like Great Britain, where it is impossible to be more then seventy miles from some coast, the surrounding seas prevent our ever suffering extremes of heat or cold.

With a huge mass of land like Asia, which stretches from


North-Western Lowlands
Central Chain of Plateaus & Mountain Ranges
Eastern Highlands & Basins
Band
River Plains
Arabian Tableland
Dekkan Tableland
Highlands
Tablelands
Eastern Highlands & Basins
Lowlands

Surface Divisions of Asia. Compare with the physical map in the atlas. The West Asian plateaus are continued eastwards through Tibet and then bend round southwards through Burma. On the north-west are lowlands and on the north-east the highlands and basin of Eastern Asia. Along the south side beneath the central chain of plateaus is a band of river-plains in Iraq and Northern India, which rise again to the tablelands of Arabia and India.

the polar seas to the equator and almost halfway round the world, the case is very different. It is easy to find places in Asia twenty times as far from the sea as any place in England. Except near the coasts, therefore, the influence of the sea is small: the land as a whole heats rapidly in summer and cools as rapidly in winter. Twenty degrees of frost is reckoned severe in England, but in North-East Asia there are places which endure every winter 80 degrees Fahrenheit below freezing or even more. Nearer the equator the effect of the great land mass is to produce a summer temperature of fully 90 degrees

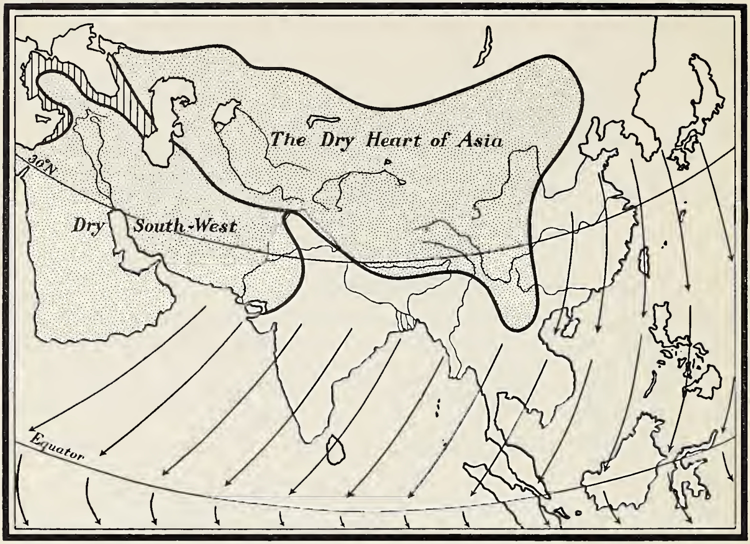


Section from South to North across Asia. This section will help in picturing the surface of Asia—the central chains of plateaus with the Siberian Lowland on the north, and on the south the river plain of the Ganges and the Dekkan Tableland. Heights again are enormously exaggerated.

in the shade over a wide area towards the south-west of the continent.

Perhaps 90 degrees may not sound very much: we sometimes reach that temperature, for an hour or two, in an English heat-wave. But the effect when it continues for months together is enormous. From the superheated surface of the land the hot air rises as from a furnace, and just as at a furnace door a strong in-draught of air is set up, so from far and near the air is drawn in towards the interior of Asia. But towards a furnace door the air will move by the most direct route: towards the heated plains of inner Asia the winds blow on a curve, aiming, as it were, always to the right of the place they really want to reach, but moving gradually towards it in a left-handed spiral.

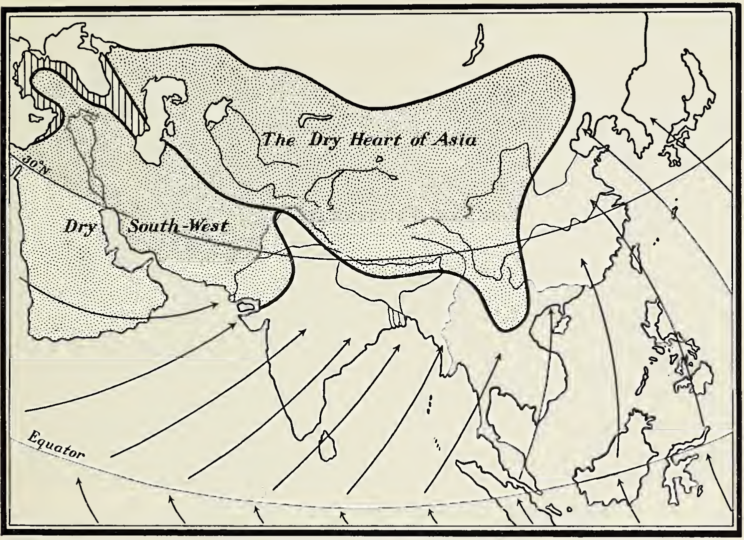
In winter it is just the other way. From the cold north-eastern interior the winds move outwards. Their course is again curved, though not so sharply, and the curve is now right-



Winds of South-Eastern Asia in January. In winter the winds are blowing from land to sea and are therefore mostly dry. South-Eastern Asia then has little rain.

handed. South of lat. 35° N. these winds will be blowing from the north-east and will mingle with the ordinary north-east trade winds. Over all South Asia the trade winds are in fact the usual winter winds; and blowing mainly from inland they are mainly dry; only when they pass over the sea do they bring a supply of winter rain to coasts and islands lying in their path.

But right round from India to Japan the main, and often the only, rainfall occurs in the summer season. This is the time of the "monsoon" (a word of Arabic origin which means



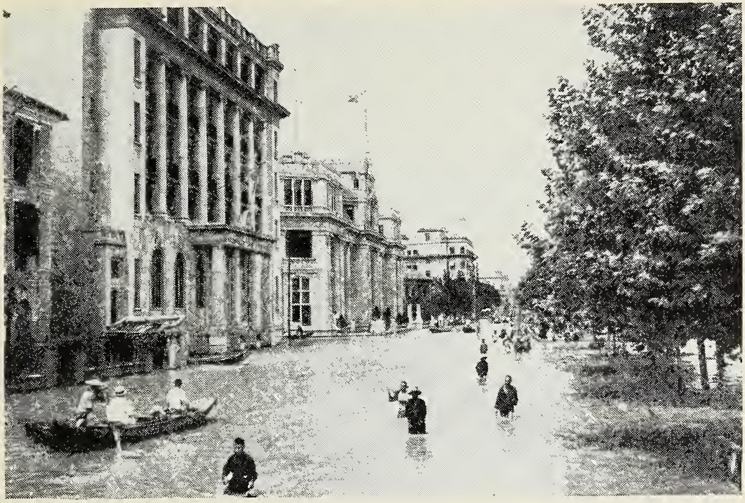
Winds of South-Eastern Asia in July. The heart and south-west of Asia are dry lands, cut off from rain-bearing winds. But to the south and east the monsoons, blowing in the summer from the sea, bring rain to most of South-Eastern Asia.

" season "), and the monsoon wind, which gives to Asia her wettest, wealthiest fringe, is the in-draught towards the region of intense summer heat described on page 187.

In India the change that is to reverse the regular trade winds begins when the sun crosses the equator in March to spend the next six months over the Northern Hemisphere. But it takes about two months of most uncomfortable heat to start the monsoon working. Gathering first from the coastal waters and then from more distant regions of the Indian Ocean, the south-west monsoon brings with it the burden of moisture collected from thousands of miles of sea. If it meets with mountains on the coast, it must rise above them and be forced to rid itself, in the cooler upper air, of its moisture, which falls in showers and sheets and deluges of rain. If it meets no mountains immediately, it passes inland till the upward motion of the heated air produces the same effect.

The effects of the burning drought of April and May on plants and animals are in some ways curiously like those of our northern winter. Birds cease to sing, flowers wither, trees shed their leaves, the very insects disappear. The grass turns brown, the soil cracks, and man and beast wait impatiently for June and the monsoon. Gradually the air becomes saturated with the wind-borne moisture; the sky turns from brilliant blue to dull lead, but not a breath stirs the sultry heaviness of forest or field. As the monsoon draws nearer, the days become hotter still and the nights more unbearable, while the clouds heap themselves on the western horizon. At last the lightning plays in blinding flashes over hills and sea, and with deafening thunder the rain descends. The monsoon has burst. In a few hours the rivers are roaring bank-high and flooding every level plain, while down the mountain-sides the torrents are wearing fresh channels in the crumbling soil. The beating of the rain on trees and roofs drowns the sound of the human voice, and in the first uproar of the deluge sleep is impossible. Gradually the first violent rains pass over and the sky clears, but heavy morning showers continue at intervals for several months. The effect of the rain is extraordinarily sudden. In a single day the land begins to turn from brown to green. Birds, beasts and insects are active again, and man goes forth rejoicing to his labour in the rain-soaked fields.

Further east, as in Siam and Southern China, the monsoon reaches the coast as a southerly wind, for it is curving inwards all the time. In North China and Japan it has become a south-



Floods in China, showing a street under water at Wuhan on the middle Yangtze River. The Upper Yangtze is fed in summer by the melting snows and glaciers of high mountains in Tibet. To this is added heavy monsoon rains over its middle and lower course. Such floods may submerge fields and crops for weeks and ruin harvests as well as drown many villages.

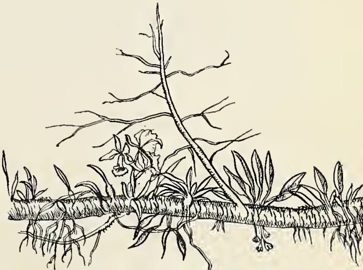
east wind and blows from the open Pacific. Its effects may be felt far inland, though in ever lessening quantities of rain. But here is a curious and dismal fact: the regions that suffer most from the intense heat which causes the monsoon never benefit from its rains! Those spiral wanderings have exhausted its supplies before it reaches the heart of Asia.

Up to the great mountain barriers which hem them in, the monsoon lands of South Asia are covered with thick forest or jungle, only partly cleared, even yet, to make room for the

A Scene in the Equatorial Forests. With the continuous great heat and heavy rainfall in the islands near the equator, vegetation is very dense. This photograph was taken in one of the East Indian islands.

villages and the crops of their inhabitants. Just as the coco-nut is the chief tree of the coasts, the most typical trees of the jungle are teak, the most lasting of timber, and bamboo, the most generally useful to the natives. Trees grow high and close together, and the tangle is made worse by ferns and other plants which not only spring from the ground but grow from hollows on the trunk and branches (as in the sketch below). Creepers coil round the stems and spread from tree to tree until the whole seems matted together and progress is only possible with an axe. Many animals have their home in the jungle: tigers and herds of elephants, monkeys and poisonous snakes. For centuries the Asiatic elephants have been tamed, and their strength put to many uses, but few are rich enough to own them.

13 Plants Growing on a Branch.

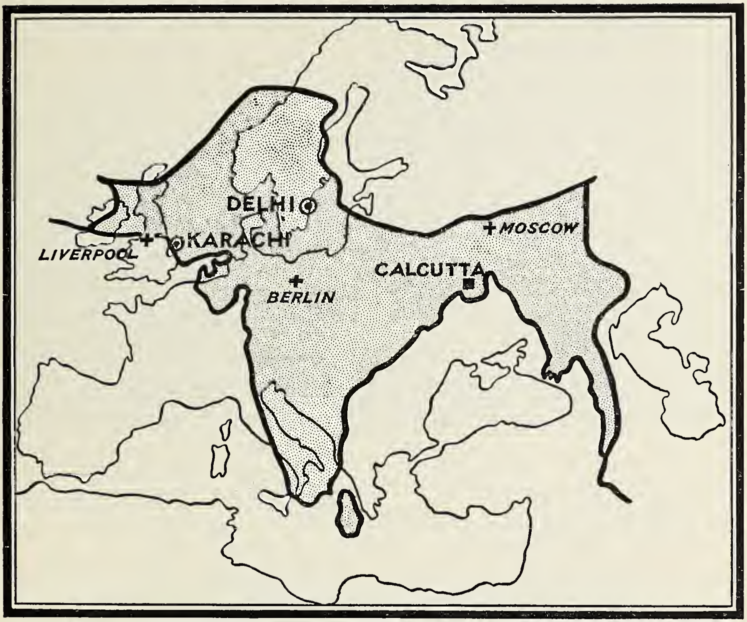


The Khyber Pass. The picture shows a caravan during a halt on its journey through the pass. Notice the barren nature of the country. The slopes are dusty and stony; scattered low, dry bushes are the only signs of vegetation in this arid country.

CHAPTER 25

INDIA: THE LAND AND ITS USES

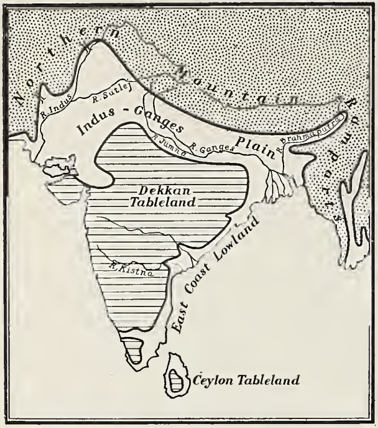
THE mountain chains surrounding the plateaus of Western Asia gather into a knot in "High Pamir" to open again eastwards round the lofty plains and valleys of Tibet. The southern boundary of this forbidden land is the gigantic range of the Himalayas, which contains Mount Everest, the highest mountain in the world (29,000 feet) and several others over five miles high. South of the Himalayas lie the plains and peninsula of India cut off from the rest of Asia, as Italy is



The Size of India and Burma. India is placed over Europe. Indian names are printed in upright letters, European names in sloping letters. India would reach from central Norway to the toe of Italy, from Ireland to central Russia. If Karachi were placed near Liverpool, Calcutta would be near Moscow. Burma is included to show the size of the Bay of Bengal.

cut off by the Alps from the rest of Europe. But seventeen Italys would not cover India, and the Alps would be wholly lost under the Himalayas.

That mighty tangle of peaks and precipices is threaded only by a few rivers, tumbling through impassable gorges into the plains of Northern India. The Himalayas have proved as

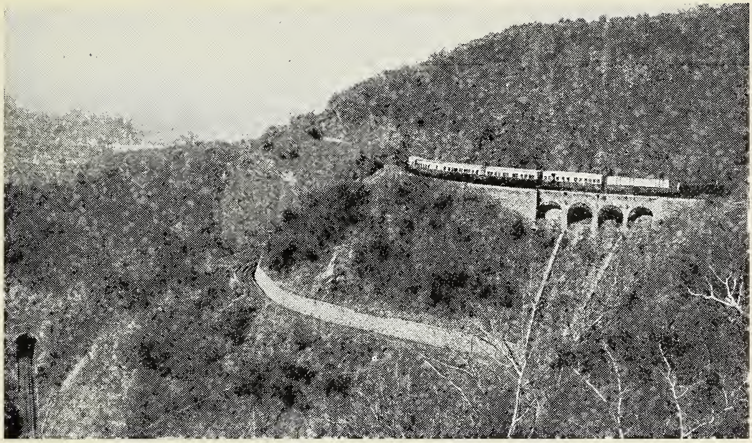


Surface Divisions of India. Compare with the map in the atlas. Notice the three great divisions: the northern mountains of which the Himalayas are part, the plain of the Indus and the Ganges, and the Dekkan Tableland.

good a barrier to invading armies as they are in keeping out the winds of Central Asia. Only in the north-west, between the Himalayas and the sea, does the mountain barrier fall low enough to allow of an occasional pass. The chief of these is the Khyber, through which both traders and invaders have descended in all ages to bring profit or ruin to India and her peoples.

Round the two ends of the 1,500 mile front of the Himalayas the Indus and the Brahmaputra turn into very different regions. The Indus and its four great tributaries water the Punjab (the "land of the five rivers"), which is the very centre of the region of summer drought. The Brahmaputra joins the Ganges in the wettest corner of India to form their joint delta at the head of the Bay of Bengal. South of these river-plains the Dekkan stretches, a triangular tableland, to Cape Comorin and the Island of Ceylon. Like Arabia, the Dekkan is tilted high on the west, and from the ridge of the Western Ghats the Kistna and other rivers flow down the eastward slope to build, with the mud of the Dekkan, the coastal plains that fringe the Bay of Bengal.

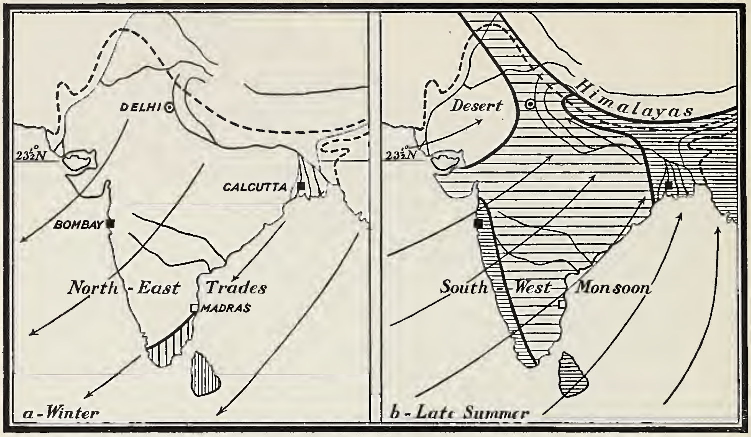
India is a vast country nearly as large as Europe with a population of 350 millions, a sixth of all the people in the



The Lower Slopes of the Himalayas. The narrow gauge railways are clever feats of engineering. The train is climbing up to Simla. Sharp curves, steep gradients and zigzags help the upward climb. Three stretches of the line, one above the other, are visible here. The lowest emerges from a tunnel on the left.

world; and since most of these obtain their livelihood from the soil, the monsoon rains are the great event of the year.

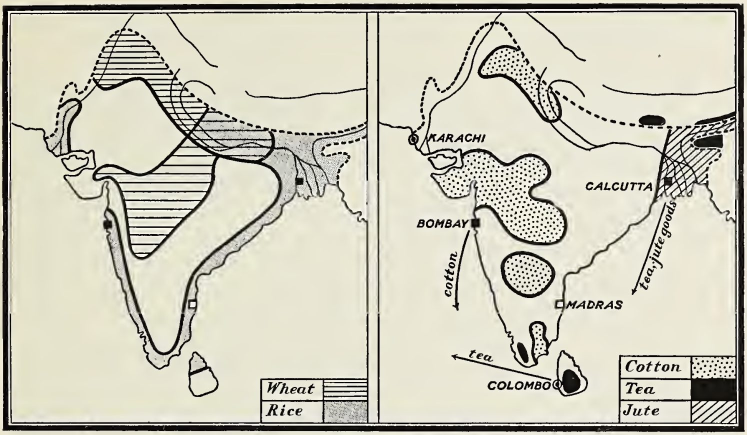
While the north-east trade wind blows, the land is parched and dusty with the temperature of a hot English August, though this is the "cold weather." But with April the plains grow hotter and ever hotter. Those Europeans who can manage it take refuge in the cooler climate of the hill stations such as Darjeeling or Simla, which at 7,000 feet is a very rainy place but with a temperature in summer of an English May or June. This "hot weather" lasts till the middle of June, when the monsoon "bursts" on the west coast. By July the rains have spread over most of India: the rivers



Winds and Rainfall of India. As in the figure for the winds of Asia on pages 188-9, in winter the winds are blowing from land to sea and are dry; only the southern tip and Ceylon then have rain. On the other hand, in late summer the winds are reversed, blow from sea to land, and are wet.

are in flood, and engineers are anxiously watching their bridges and irrigation dams. The peasant rejoices in the life-giving rain, but the Europeans left in the plains swelter in the steamy heat and see all their possessions mildewing in the constant damp. India, however, is safe for another year.

The monsoon from the Arabian Sea drenches the Western Ghats, but its rains are less certain as they cross the Dekkan tableland. Another current, from the Bay of Bengal, makes the Ganges delta a vast lake and then, turned by the wall of the Himalayas, scatters a decreasing rainfall over the northern plains till little or none is left for the Punjab. So there are four rainfall regions in India. Along the west coast there is plenty, and plenty also on the Lower Ganges and the hills of Assam. On



Some Products of India. The left-hand map shows the distribution of two important food grains. Rice grows in the wet and irrigated plains, wheat in the drier north-west. The two grains overlap along the middle Ganges.

The right-hand map gives the distribution of three commercial crops: cotton chiefly in the sunny lands of the west and north-west, jute along the rivers of the north-east, and tea on the hill-slopes of the north-east and in Ceylon.

the plains of the Indus there is never enough, and life depends on irrigation. Over the rest of India, from the Upper Ganges to the South-Eastern Dekkan, there may be much or little, and this is the region of possible famine. In most years the monsoon fails somewhere: once in a dozen years the failure is widespread, and the distress, unless prevented by irrigation, becomes a most serious problem for the Government.

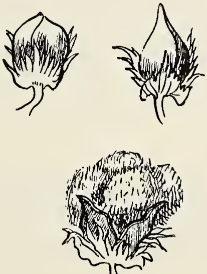
Though there are enormous numbers of cattle in India, they are used mainly to draw carts or ploughs and for such milk as this labour allows them to give. The Hindus never eat meat. Their chief foods are rice and millet. Rice needs great

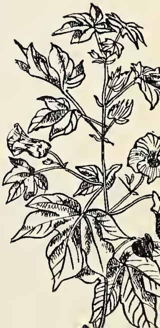
Jute. The jute plant is a tall reed. It grows on the wet lands of the rivers of Eastern Bengal and Assam, which supply the whole world with jute.

heat and much water ; indeed it must be planted out in flooded fields, and the work in the mud is very hard. But the food value of the crop is high. Millet is a poor grain which we only give to canaries, but it is largely eaten in the Dekkan and North-West India, where rice cannot be grown. Fortunately in so hot a climate two or even three crops can be grown each year. These may be all rice, planted in irrigation water, or cotton in the wet season and wheat or millet in the months when water is less plentiful; but wheat is only grown in the north.

Cotton, jute and tea are the chief crops grown for sale.

Cotton grows on the rich volcanic soils of the Dekkan, but the quality is poor and it is used mainly in the Bombay mills and in Japan. Jute is a thirsty reed that flourishes in the mud of the Lower Ganges and Brahmaputra valleys. It is manufactured in the Calcutta mills into twine and rough sacking. During the Crimean War, Dundee in Scotland was cut off from its supplies of the Russian fibre plants, flax and hemp. Instead of them jute was introduced from Calcutta and is largely used in the factories of Eastern Scotland. Tea, which is the dried leaf and not the fruit of the shrub, like cocoa or coffee, can be grown more widely than either of these, since it is better able to resist frost. It needs heavy rainfall but good drainage and grows best on the hillsides of North-East India and Ceylon. The leaves are picked several times a year, a task that requires nimble fingers and cheap labour such as India and Ceylon can supply.





Right: Part of Cotton Plant.

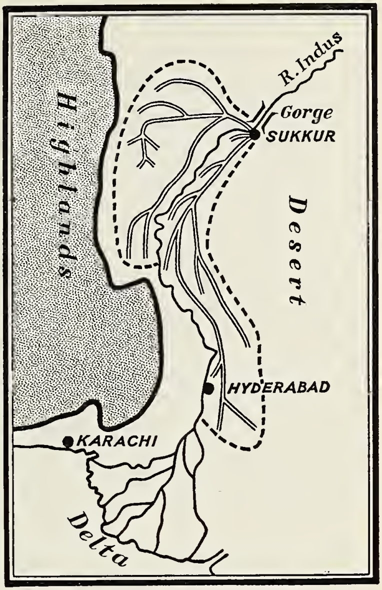
Left: Cotton Bolls.

An Indian Village. India is a land of half a million villages, many of them only reached by paths. The mean huts are of sun-dried mud, one storey high, and roofed with small mud tiles of wood and grasses; the street is a mere earth track, the cattle small and thin.

CHAPTER 26

THE INDIAN PEOPLE

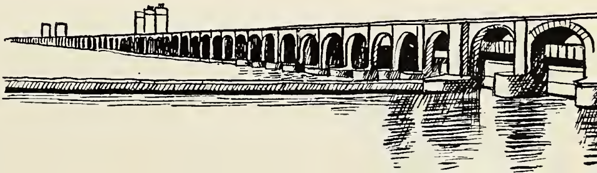
IN a country where four-fifths of the people depend entirely on the land, the population is naturally densest in the river plains and coastal regions, where soil and water conditions are most favourable to crops. Of all the river plains, those of the Upper Punjab and the Ganges have the largest number of inhabitants, and in the combined delta of the Ganges and the Brahmaputra the peasants are crowded still more thickly. But the population is scanty wherever in the interior the rain falls less frequently. It is scantiest of all in the Indian Desert, which lies east of the Middle Indus, in the region of summer



The Sukkur Irrigation Scheme. The dam has been built at the lower end of a gorge where the Indus crosses a band of hard rock and is confined between its walls. From above the dam, irrigation canals fan out and change what once was a desert into rich farms.

heat never reached by the monsoon. Here, however, the irrigation schemes of the Government are working the greatest miracles.

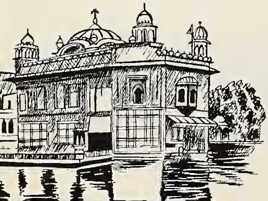
In early summer the Indus and its tributaries are filled with the melted snows of the mountains, and a system of canals has long been used to bring the flood water to the fields. But the flood is not always high enough to fill the canals, which in any case are dry again by late summer. So here, as under the old method in Egypt, the riverside farmers could only grow one crop a year. A great dam has now been built at Sukkur, turning the long gorge of the Indus above it into a vast reservoir capable of supplying a region larger than Wales with water at all seasons. Two or three crops can now be grown each year, and more land is being steadily brought into cultivation. Similar works, some provided by the Government, others by local benefactors, are gradually supplying the drier parts of India with constant water. This increases the general prosperity and prevents the famines which have too often visited the country in the past.



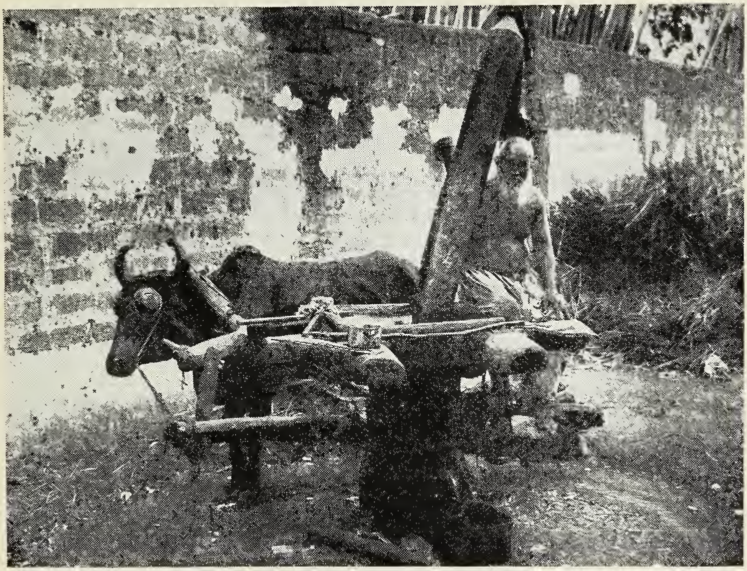
Sukkur Barrage

Ploughing in India. Much of Indian agriculture is still very simple. The plough is made of wood, and the pair of humped bullocks are small beasts. The result is that the furrow is shallow and the thin layer of ploughed soil is soon exhausted.

The Indian peasants live in half a million villages unreached, for the most part, by proper roads and cut off by the jungle from the world outside. For centuries they have tilled their fields and managed their affairs as their fathers did before them. A group of wretched dwellings of sun-dried mud or bamboo is huddled round the only well. The headman of the village, the guardian of its customs and its rights, and the banker may be better housed, and there will be a temple or, in Mohammedan districts, a mosque, with the priest who keeps it. The blacksmith and the leather-dresser, the oil-presser, the weaver and the potter,

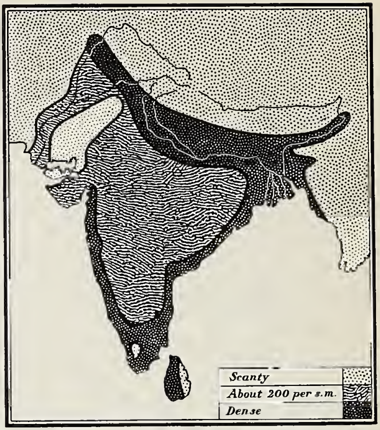


Indian Temple.



A Primitive Oil Mill. Here a revolving upright beam is harnessed to a bullock, which travels round and round; its left eye is blindfolded. The weight of beam framework and the man himself, as they are turned, crush the seed in the container, and the oil pours out into the vessel on the ground.

the servants of the village who supply all its needs, live apart, receiving a share of the harvest for their services. It would be hard to imagine anything less like the farms and homesteads of the English countryside than these villages. Living with the rest for company and security against robbers and tigers, each villager may rent four or five small patches a mile or more apart. Perhaps his whole holding amounts to two or three acres, and from this and the common pasture he supports his family. His



Distribution of Population in India. The map shows the distribution of population—an outer frame of high density along the productive plains, enclosing an interior of moderate density of about 200 to the square mile. In the dry north-western deserts population is scanty.

scattered strips mean extra toil, but also greater variety of soil and moisture. Water is his chief concern, and he watches for the monsoon as the Egyptian watches for the rising Nile. He has no stores to tide over a bad season, and he must pay his rent and taxes. He is generally in debt either to the banker or the landlord, and usually to both. Since few markets are within reach, he grows nothing for sale and never changes the methods by which his fathers lived or starved. Indian agriculture sadly needs stronger cattle and steel ploughs. The primitive oil-mill is another example of out-of-date methods in India. Modern machinery would not only do more work with less labour, but would extract more oil from the same amount of seed or coconuts.

Except the great sea-ports, India has few modern cities. Earlier princes fortified their capitals, gathering round them the merchants and the craftsmen who made India famous by their work in metal, stone, ivory and silk. Patna on the Ganges is an old Hindu capital; Benares, with its thousand temples, a place of pilgrimage where pious Hindus wash away their sins in the sacred waters of the Ganges. It is renowned for the beauty of its buildings, its palaces and temples, as well as for the delicate design and craftsmanship of its workers in brass

Benares. Benares on the banks of the Ganges is the Holy City of the Hindus. To the Hindu all water is sacred and "Mother Ganges" in particular. Every devout Hindu wishes to make a pilgrimage to the city's bathing places.

and copper and silver. Allahabad is a trading centre where the Ganges and the Jumna meet, while Delhi on the Jumna, between the plains of the Ganges and the Indus, was the capital of India's Mohammedan conquerors as it is today of the British Government.

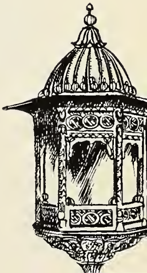
For centuries the Mohammedans from Central Asia, the Moguls (*i.e.*, Mongols), swept down in wave after wave from the north-western passes, and they were still in possession when the last great invasion occurred, now, however, from the sea. This was the coming of the European traders: Portuguese, Dutch, French and English. For nearly 200 years the English East India Company and its successor, the British Government

Calcutta is a modern port created by the English. The harbour, with docks and river moorings, can take 100 vessels, some of which are seen lining the bank of the river. On the opposite side is Howrah, the industrial area, and the two cities together contain well over a million people. From them pass out all over the world jute, tea, oil seeds, hides and many other products of the rich Ganges Plain behind.

itself, have been masters of the country, though much of it is still ruled by its own princes under varying degrees of British control. India, the greatest of British overseas dominions, is remarkable for the smallness of its European population as compared with the native. We notice the same state of affairs in our African territories, but India has a civilisation of her own far in advance of anything we found elsewhere.

British control has brought many benefits to India. It has put an end to warfare and done much to secure liberty and just dealing for everyone. Much British money has been spent in developing industries and building a network of railways to increase trade and rush supplies to districts threatened with famine. Crops for export, such as tea, have been added to the native food crops, and modern ports created to deal with them: Calcutta, seventy miles up the Ganges delta, Bombay and Madras on either side of the Dekkan, and Karachi near the mouth of the Indus. The spread of education has already produced a small but very important class of students and professional men, whose ideas are centuries in advance of those of most of their fellow-countrymen.

The first duty of the British Government of India has been to improve the miserable condition of much of the population. Recently the educated classes have demanded that India should have a freer hand in her own government, and though this has been granted, many difficulties stand in the way. Some of the most serious, which are not likely to be easily or quickly solved, are the presence of two great hostile religions, Hinduism and Mohammedanism; the fact that nearly half India is ruled by independent princes content with the present system; the backward condition of the peasant, and the class divisions of the Hindus themselves.



Indian Craftsmanship

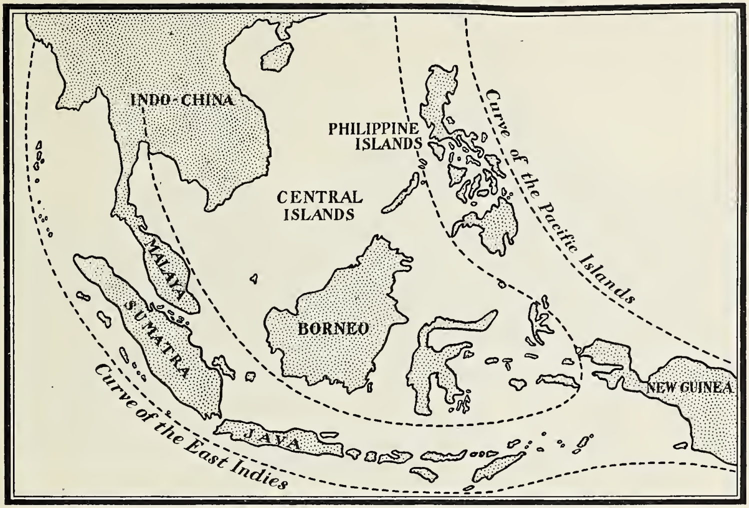
Rice Growing. The small plants are raised in nursery beds, from which they are planted out into the mud-flooded fields. Bundles of young plants are seen scattered about the water, ready for planting plant by plant with immense labour. The raised bank which keeps in the water can be seen above the stooping workers.

CHAPTER 27

INDO-CHINA AND THE EAST INDIES

THE lands that lie between India, China and Australia are divided unequally by the equator. They cover the readiest passage from the Indian Ocean to the Pacific, and the traffic of ages has left upon their shores settlements of many different peoples.

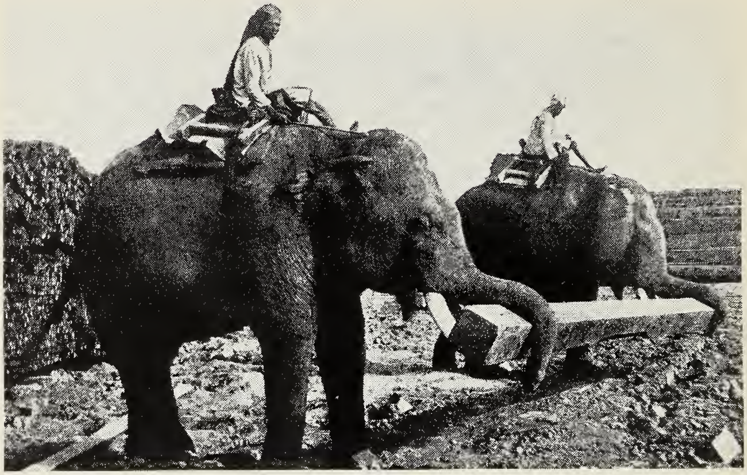
The mountain ranges of Middle Asia bend southward with the Brahmaputra and are drowned at last in the sea. The last to survive is the range that separates Burma from Siam, forming before it sinks the long arm of the Malay Peninsula.


INDO-CHINA
PHILIPPINE ISLANDS
CENTRAL ISLANDS
MALAYA
SUMATRA
BORNEO
JAVA
NEW GUINEA
Curve of the Pacific Islands
Curve of the East Indies

Plan of the Islands of South-Eastern Asia. Think of the islands as a group of central islands, flanked by two curving chains which meet in New Guinea. Square, massive Borneo is the largest of the central group. Sumatra, Java and other smaller islands of the East Indies flank it on the south. The long chain of the Philippine Islands flanks it on the Pacific side.

But the mountains that separate India from Burma rise again in a curving chain of islands running eastwards to New Guinea. Shorter chains may also be traced running northward to the China coast.

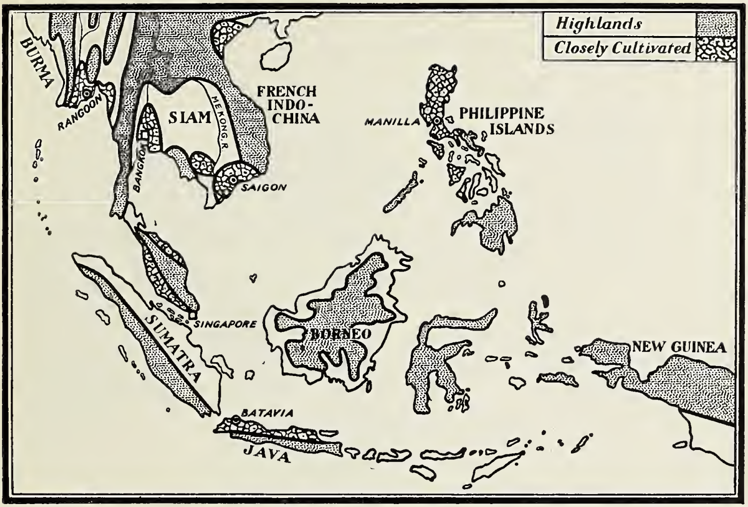
The Indo-China Peninsula consists of Burma, the kingdom of Siam, and French Indo-China. Much of the old civilisations of these countries came from their neighbours India and China. The people, who got their Buddhist religion from India, have high cheek-bones, yellow-brown skin and straight black hair which shows them to be similar in race to the Chinese.



The Teak Industry. Teak is a hard wood of the forests of Southern India and Indo-China. Here a pair of elephants are seen working as a team, carrying and piling the squared logs.

For a monsoon country, Indo-China is not very densely populated. Fringed with fertile delta-lands, it is an excellent region for rice and exports countless bags of it to places that cannot grow rice or, like Java, grow too little for their needs. Rice, like wheat or oats, is merely the cultivated form of a special kind of grass, but it needs greater heat and far more water than other grain crops. In these countries it is grown either in banked fields or on hillside terraces supported by stone walls.

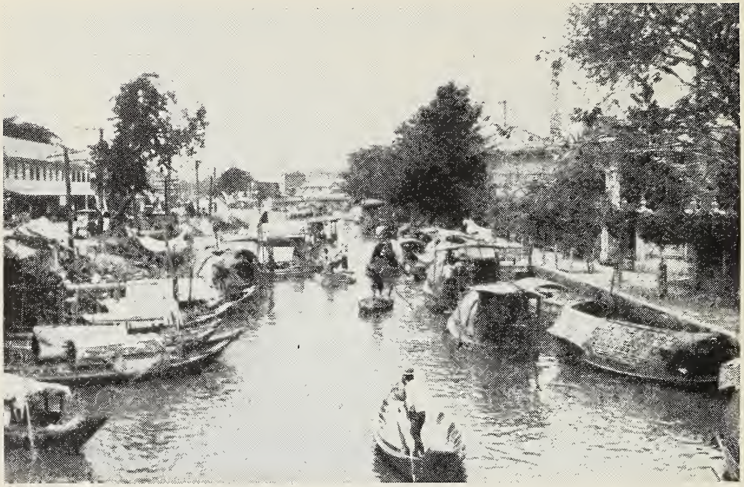
The monsoon jungle is rich in timber. Kipling has described the elephants piling the teak " in the sludgy, squdgy creek," as he has also told us of the " spicy garlic smells, the sunshine


Highlands
Closely Cultivated
BURMA
RANGOON
SIAM
MEKONG R.
BANGKOK
FRENCH INDO-CHINA
SAIGON
MANILLA
PHILIPPINE ISLANDS
SINGAPORE
SUMATRA
BORNEO
NEW GUINEA
BATAVIA
JAVA

Chief Cultivated Areas of Indo-China and the East Indies. Both mainland and islands are mountainous. On the mainland the chief closely-cultivated areas are along the lower valleys and deltas of the rivers, on the islands, and in the Malay Peninsula along the coastal lowlands.

and the palm-trees and the tinkly temple-bells" of the Irrawaddy River, on the delta of which lies Burma's chief port, Rangoon. Teak is very valuable for shipbuilding and building work generally. It is hard and solid as oak, but superior to the latter because it contains an oil which resists the weather and prevents iron bolts from rusting.

The Burmese do not take kindly to heavy work. The docks, railways, oil-wells and many other businesses are managed by foreigners, while Chinese and Indian "coolies" supply the labour. The British fill the Government posts, but few of all these incomers from abroad stay all their lives in Burma.



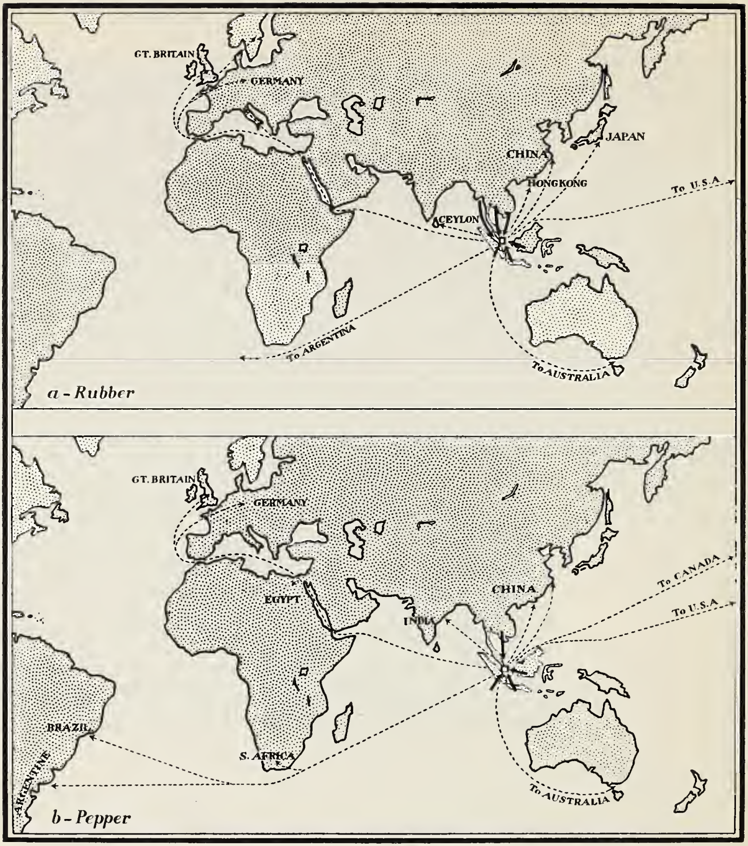
Bangkok. The river's branches and canals not only carry a large trade but also a large houseboat population. Some of the boats in the picture are lightly protected from sun and rain, others have more solid living quarters.

Siam is a go-ahead country governed on modern lines largely with the help of Europeans and an increasing number of Japanese. Its education system was built up by British officials, and British business men have started teak, shipping and other industries in Siam, but the country is independent. The capital is Bangkok on the delta of the Menam River.

French Indo-China includes much of the valley of the Mekong River. The chief port, Saigon, lies on its delta. In France's colonial empire this territory ranks next to her African possessions, and under French care the native population is being well taught and wisely governed.

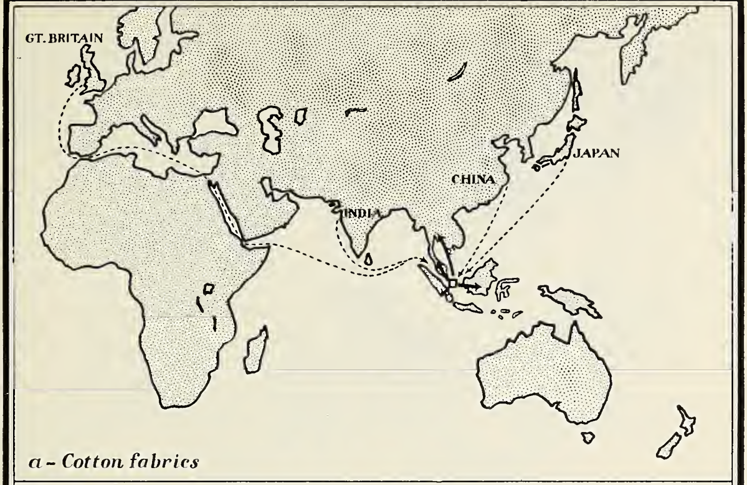
Rubber Tapping in Malaya. Here an Indian coolie has made a slanting cut in the bark half-way round the tree with his knife. The milky sap is collected in the tin cup attached below. The cut heals up so quickly that the trunk is cut at frequent intervals in order to keep up the flow of sap. Earlier healed cuts are visible in the picture.

The long, paddle-shaped Malay Peninsula stretches almost to the equator. The handle is shared between Burma and Siam, but the blade is British Malaya, and its tip is the island of Singapore. Singapore is the natural centre of the island world around it, and, lying at the very door of the Straits of Malacca, it is also the key to the Far East. Thirty thousand coastal and sea-going ships enter its harbour every year, many on their

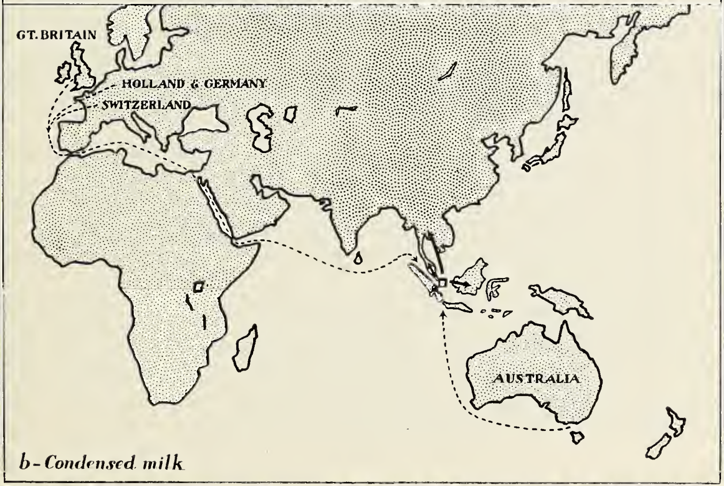

GT. BRITAIN
GERMANY
JAPAN
CHINA
HONGKONG
To U.S.A.
CEYLON
To ARGENTINA
To AUSTRALIA
a - Rubber
GT. BRITAIN
GERMANY
To CANADA
CHINA
To U.S.A.
EGYPT
INDIA
BRAZIL
ARGENTINE
S. AFRICA
To AUSTRALIA
b - Pepper

Singapore as an Ocean Junction. The four maps on these pages illustrate with four products the work of Singapore as an ocean junction. The two maps on this page show how the port collects rubber and pepper from the mainland and islands near by (thick arrows) and then distributes them to distant countries all over the world (broken lines).

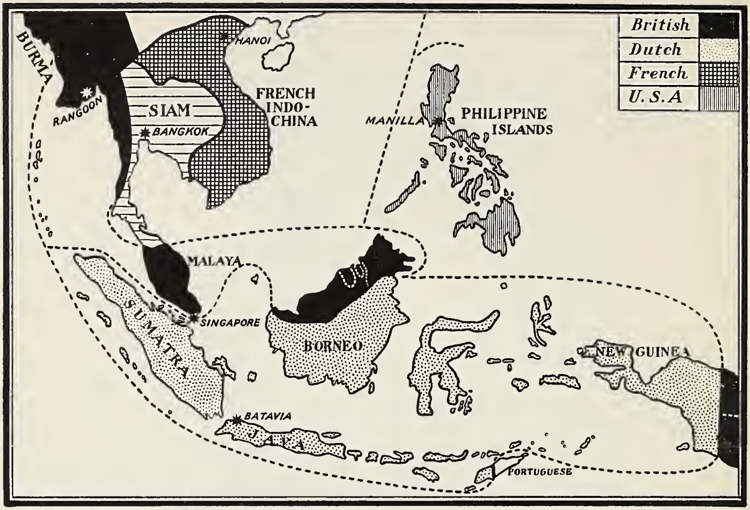
The two maps on page 217 show how Singapore collects manufactured products from distant countries (broken lines) and distributes them to the mainland and islands near by (thick arrows).


GT. BRITAIN
JAPAN
CHINA
INDIA

a - Cotton fabrics


GT. BRITAIN
HOLLAND & GERMANY
SWITZERLAND
AUSTRALIA

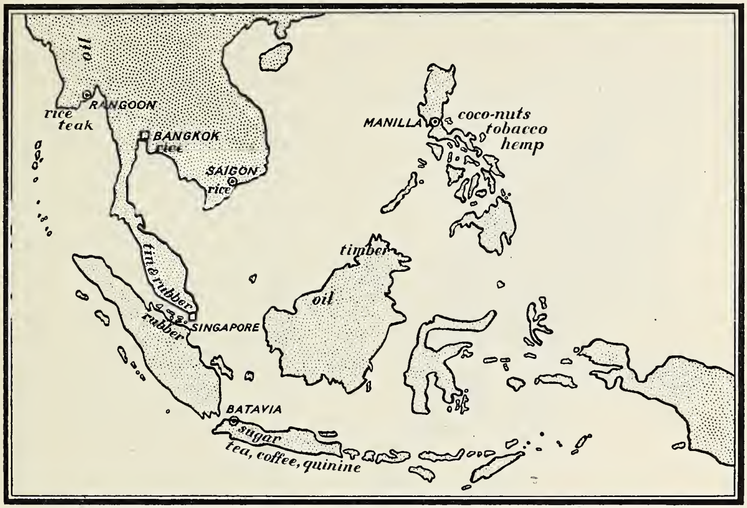
b - Condensed milk


British
Dutch
French
U.S.A
BURMA
RANGOON
HANOI
SIAM
BANGKOK
FRENCH INDO-CHINA
MANILLA
PHILIPPINE ISLANDS
MALAYA
SINGAPORE
SUMATRA
BORNEO
NEW GUINEA
BATAVIA
JAVA
PORTUGUESE

Foreign Possessions in Indo-China and the East Indies. European nations have long been interested in this region—*e.g.*, for spices like pepper. Siam is the only independent State. The United States took the Philippine Islands from Spain. The greatest area, including Sumatra, Java and most of Borneo, belongs to the Dutch Colonial Empire.

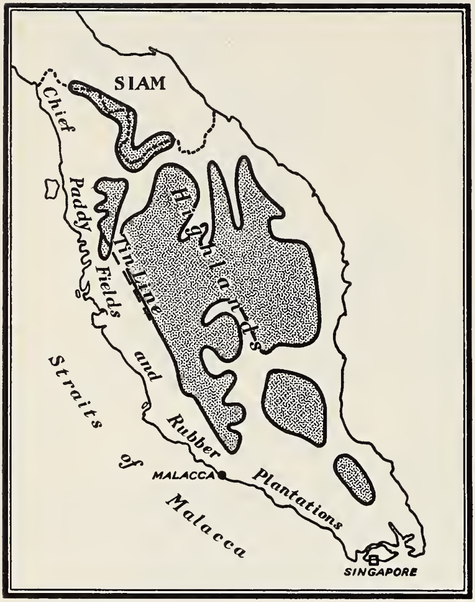
way from Europe to the Far East, but most with cargoes from Indo-China and the islands, to be carried away again, when sorted and repacked, to more distant lands. The rubber and tin, which Malaya produces so plentifully, are largely shipped to the United States.

The Malays, like the Burmese, are rice-growers. The rubber plantations, which share the west-coast lowlands with the rice-fields, are managed by Europeans and manned by Indian coolies. The tin mines along the foot of the mountains are worked mainly with Chinese labour.


oil
RANGOON
rice
teak
BANGKOK
rice
SAIGON
rice
MANILLA
coco-nuts
tobacco
hemp
timber
tin & rubber
oil
SINGAPORE
rubber
BATAVIA
sugar
tea, coffee, quinine

Chief Commercial Products of Indo-China and the East Indies. The South-Eastern Islands still produce the spices which made them famous of old, but the trade is now small since spice is no longer important as a preservative.

Rubber is the sap of certain trees which were first found in Brazil. Its name comes from its earliest use in Europe, to rub out pencil marks. It was called india-rubber because the American Indians were known to make it into balls, but it was long before anyone discovered other uses for its bounce. Modern rubber-growing is mainly the result of the need for motor-tyres. The collection of "wild" rubber from scattered trees in the dense forests of the Amazon proved too slow and expensive for the new demand. Young plants were therefore reared in the hot-houses of Kew Gardens and sent to start plantations in various tropical countries, but the business has only flourished



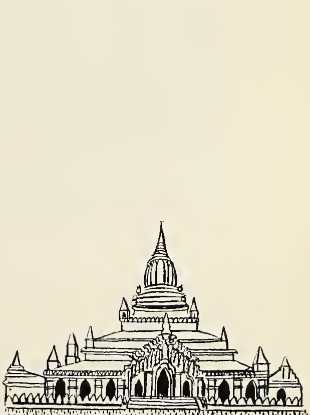
Some Products of Malaya.

The peninsula has a backbone of mountains. The chief lowland is on the west side, and here mainly are the rice fields of the Malays and the rubber plantations of British companies. Part of the " tin line " is marked along the western foot of the mountains, where tin is washed out of the gravels chiefly by Chinese. Singapore is on an island at the end of the peninsula, and is connected across the shallow strait by a causeway. Malacca is an old port of Arab traders; Singapore is a new creation of the British.

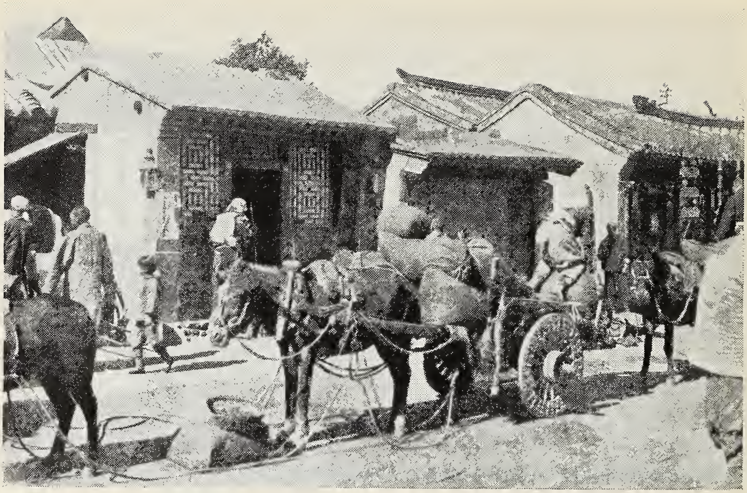
in Ceylon, Malaya and the neighbouring Dutch islands. In plantations the trees can be easily looked after and profitably tapped. The sap is allowed to harden into sheets and then exported to the manufacturers.

The islands belong mainly to Holland. The largest is Borneo, but the northern part of it is British. Sumatra, the next in size, is less important than Java, the most fertile and populous of the Dutch East Indies. The climate of the whole group, like that of Malaya, is equatorial, with a rainfall as heavy and regular as that of the Amazon or Congo Basin. The natural forest is therefore dense, but the lowlands now produce heavy crops of rice and rubber. On the hill-slopes of Java tea and coffee are grown, as well as cinchona, a tree imported from Peru, the bark of which yields quinine. The world's supply of this famous medicine comes almost wholly from Java. But the most valuable export is cane-sugar, for Dutch scientists have produced a cane which gives twice as much sugar as the cane of any other country and needs less time to grow. Batavia, the capital of Java, with over 250,000 inhabitants, is the centre of Dutch government in the East.

The Philippine Islands belong to the United States, but the Americans do not like such distant possessions and intend to leave the inhabitants to govern themselves in a few years' time. Their trade, like that of the Pacific Islands, depends largely on coco-nuts, but their tobacco and hemp make the cigars and ropes called after the capital, Manila.



Burmese Pagoda



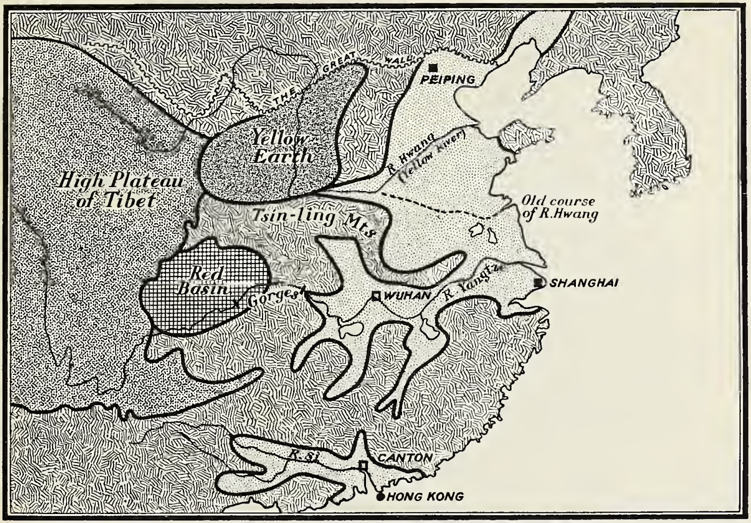
A Chinese Village of the Northern Plain. Houses and shops are only one storey high, and the street is unpaved. The low cart has heavy wheels and is drawn by the small pony of North China. Ox-carts are also used, as is also the wheelbarrow with a huge wheel and sometimes with a sail (see page 230).

CHAPTER 28

CHINA

REAL China is Monsoon China, but the name covers three outlying parts of Central Asia as well: Mongolia, Sinkiang and Tibet. The whole is larger than Europe, but more than 400 million of the 450 million inhabitants live in China itself on less than half the total area. Three-quarters of these are farmers, probably the hardest-working in the world, for the land is too small for their needs. They must toil or starve, and too often they do both, yet their cheerfulness is unconquerable.

China is now a republic, but the Chinese peasant cares little


THE GREAT WALL
PEIPING
Yellow Earth
High Plateau of Tibet
R. Hwang (Yellow River)
Old course of R.Hwang
Tsin-ling Mts
Red Basin
Gorges
WUHAN
R. Yangtze
SHANGHAI
R. Si
CANTON
HONG KONG

Surface Divisions of China. Compare this diagram closely with the physical map of China in the atlas and note (*a*) in the north, the River Hwang flowing through the "yellow earth" district, and finally across the wide plain of North China; (*b*) in the centre, the Yangtze, flowing through the "Red Basin," from which it escapes by a series of gorges; (*c*) in the south is the valley of the River Si.

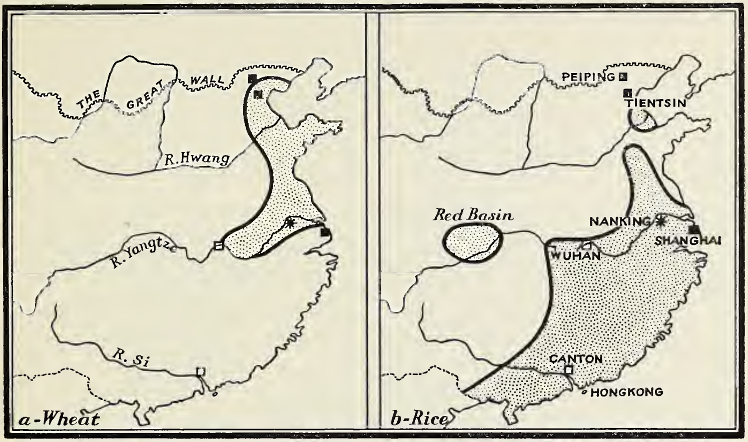
The lightly dotted areas are lowlands, the zig-zag shading shows highlands.

for the Government. Each village is a kind of republic too, and always has been. It pays taxes, which may reach the Government or be pocketed by someone in between, but it manages its own affairs pretty much as it likes. The ordinary Chinese peasant does not understand patriotism (though he may dislike interference from foreigners—a very different thing); he thinks only of his family, and for that he works—for his parents and his sisters, his cousins and his aunts: for his own wife and children he takes only his due share of the

The Temple of Heaven, Peiping. There are three terraces of white marble with a flight of steps leading from one to the other. Each terrace has a finely carved balustrade, also of marble. From the upper terrace rises a circular building with three roofs of blue tiles.

family earnings. His scanty fields are made smaller still by the sacred tombs of his ancestors. China is mainly a land of scores and scores of little villages, little farms and countless grave-mounds.

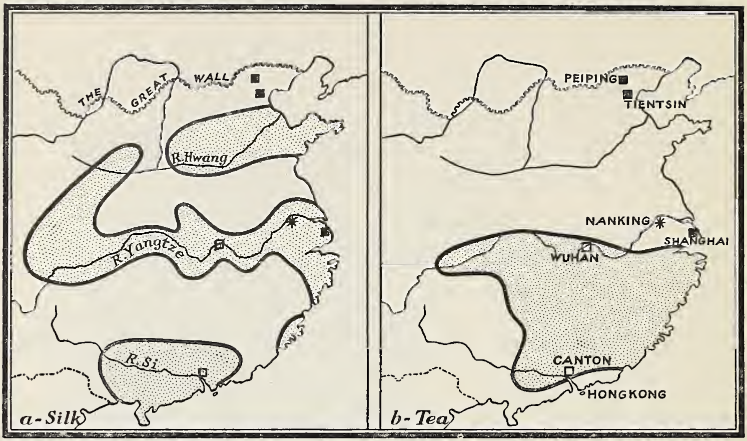
Even without the more distant territories named above there are still two Chinas, the north and the south. The rocky uplands and sheer precipices of the Tsingling Mountains, which divide the Hwang Ho from the Yangtze Kiang, divide also the northern from the southern climate. The south has warmth all the year round with winter rain from the Pacific and the summer downpour of the southern monsoon. In the north, bitter winds from Siberia make the winters cold and dry, and, to save food, many of the inhabitants spend long hours in sleep on their brick stoves, hibernating like dormice. In summer the


THE GREAT WALL
R. Hwang
R. Yangtze
R. Si
a-Wheat
PEIPING
TIENTSIN
Red Basin
NANKING
SHANGHAI
WUHAN
CANTON
HONGKONG
b-Rice

China: Products. The map shows where two important grain foods are grown —wheat in the cooler, drier north, rice in the hotter, moister south. They overlap along the Lower Yangtze, where rice is grown in summer and wheat in winter.

Pacific monsoon brings only a variable rainfall. Droughts or floods may ruin the single yearly harvest for which the farmers toil so manfully, labouring from dawn to dark.

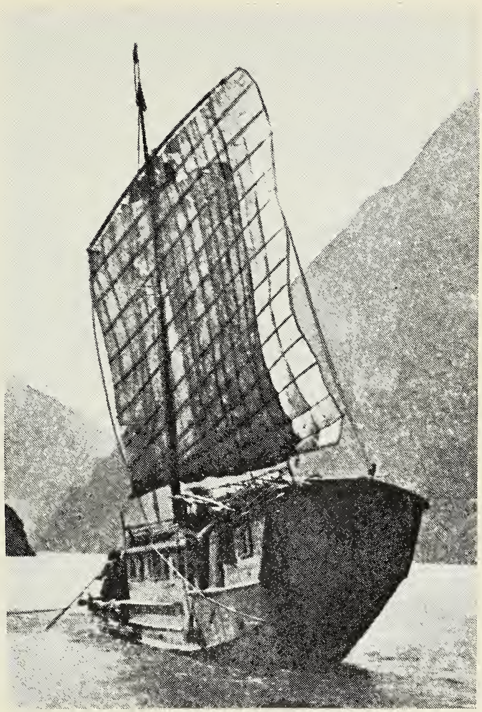
The north is chiefly the basin of the Hwang Ho, the "Yellow River." That stream flows first through vast gorges in Tibet and next in a great northward bend, cutting deep into a region of yellow soil too dry for trees, but well suited for crops where water is available. The summer floods carry the yellow mud out on to the broad plain that spreads north and south of the Shantung Peninsula. There the river swirls on a high bed of its own making, always liable, in spite of careful dyking, to make a new outlet to the "Yellow Sea." Less than a hundred years



China: Products. The left-hand map shows that the silk-worm and mulberry are reared over wide areas in north, centre and south. Tea, on the other hand (right-hand map), is grown on hill-slopes in the southern half of the country.

ago it shifted the last 300 miles of its course from south to north of Shantung and drowned a million people whose homes lay in its path. No wonder men call it " China's Sorrow "! The two chief cities, Peking or Peiping (the former capital) and the port of Tientsin, lie north of this particular danger. The Temple of Heaven is an example of the many splendid buildings for which the old capital of China is famous. Before China became a republic, the Emperor used to come to this temple in Spring to pray for blessings on the year's harvest.

Every possible acre of that plain grows wheat or "giant millet," for these are the chief food-plants of Northern China. There is no room for flower gardens nor even for pastures and dairy-farms. No trees or hedges steal goodness from the



A Chinese Junk. In this scene the junk is in the gorge of the Yangtze where it is flowing through the Red Basin. The river runs fast between the narrow, steep walls, and the boat is being hauled upstream by a gang of men called "trackers," not visible in the picture.

precious soil. Pigs and fowls, which can pick up their own living in little space, are common. Everywhere, in open weather, the fields are full of labourers, for no machines are used except a simple ox-drawn plough. Loads are carried by donkeys or in ox-carts, or wheelbarrows helped sometimes by a sail!

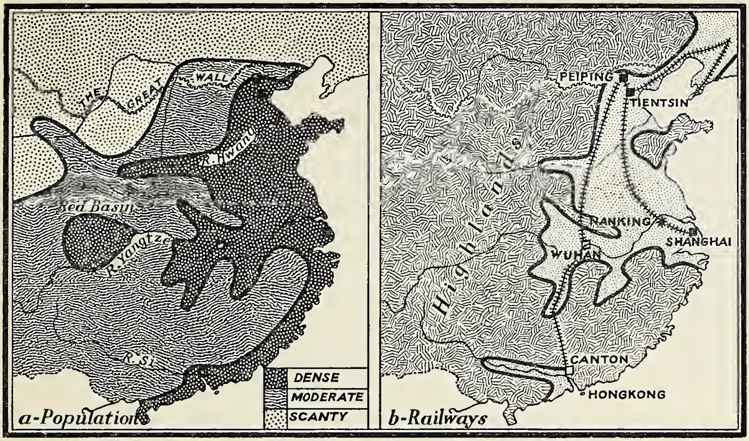
In South China green valleys replace the dusty yellow plains; winters are mild, and rainfall plentiful. There are two important rivers, the Yangtze and the Si. The Yangtze, like the Hwang, rises in Tibet and flows at first south-east between huge mountain walls. Then it turns north-east through the Red Basin. This is a sandstone country, remarkably fertile, thanks to skilful irrigation, but it is cut off by mountains from the rest

A Fishing Boat on the Yangtze. The photograph gives some idea of the enormous breadth of the river, which is the busiest river-highway in China. In the background are three junks or cargo-carrying vessels with square sails. In the foreground is a lighter boat with the net spread wide ready for fishing.

of China and can only be reached through the dangerous gorges of the river. Further down, the valley widens, and shallow lakes take much of the summer flood waters, though the river often rises from 40 to 50 feet at Hankow.

This city is a great junction of traffic by river and rail, for one of China's few lines, that from Peiping to Canton, passes through it. It lies 600 miles from the sea, but ocean-going ships can always reach it. It is a centre of the tea trade, and large quantities, pressed into "bricks," are taken by caravan or human carriers to Central Asia, though elsewhere China tea is losing favour.

On the lower reaches of the Yangtze the best Chinese silk is grown. The mulberry, on which the finest silkworms are fed, leafs twice a year in North China and even six or seven times in the south. This, combined with abundant labour, gives China


THE GREAT WALL
R. Hwang
Red Basin
R. Yangtze
R. Si
DENSE
MODERATE
SCANTY
a-Population
PEIPING
TIENTSIN
Highlands
NANKING
SHANGHAI
WUHAN
CANTON
HONGKONG
b-Railways

China: Density of Population and Railways.

(*a*) Population. The four densely inhabited regions are the northern plain, the middle and lower Yangtze Plains, the mountain-walled Red Basin higher up the Yangtze, and the coast rim of the mountainous south-east.

(*b*) Railways. The great rivers provide easy communication between west and east. Railways link north and south. One runs from Peiping to Shanghai along the eastern part of the plains. The second lies along the western side of the plains between Peiping and Canton, and has to cross the mountains between the three rivers. At Wuhan, the great central junction, it crosses the west-east waterway of the Yangtze. Large ocean steamers can reach Wuhan, 600 miles from the sea.

a great advantage over the silk-growers of Southern Europe in the production of raw silk.

Nanking, the "Southern Capital," is now the capital of the Chinese Government.[1] It lies above the thickly populated delta of the Yangtze, half-way between the north and the south; but Shanghai, which lies near the main entrance

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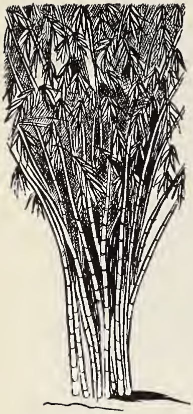
[1] Or was till recently, but the Japanese have occupied it.

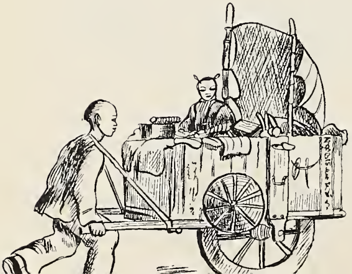


Bamboos.

of the river, is the chief gateway of the country and, thanks to its foreign settlements, one of the great ports of the world. It is also the greatest manufacturing city of China and has a population of over three millions.

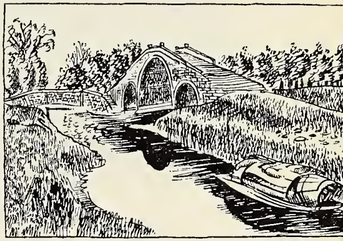
The plain of the lower Yangtze has a rival further south in the densely populated delta of the Si River. Beside it stands Canton, the centre of Southern China and of the more adventurous section of the Chinese nation. The Cantonese are quick to accept new ideas and try steadily to rouse the country from its ancient ways of thought and government. At the mouth of the river the British island of Hong-kong gathers into its sheltered harbour most of the trade of the south and forms the last Asiatic outpost of the British Empire.

The food-plant of Southern China is rice. Two, and in places as many as five, crops can be grown in a year. The rice-fields fill the valleys and rise in terraces up the hill-sides, each carefully banked to hold the water which must be spread by irrigation over the fields. Heavy water-buffaloes with broad, spreading hoofs draw the plough through the mud, and the young rice-shoots are planted one by one in the water-covered soil. Tea plants and mulberry trees and groves of bamboo clothe the higher slopes of the hills. In the cooler Yangtze valley, though

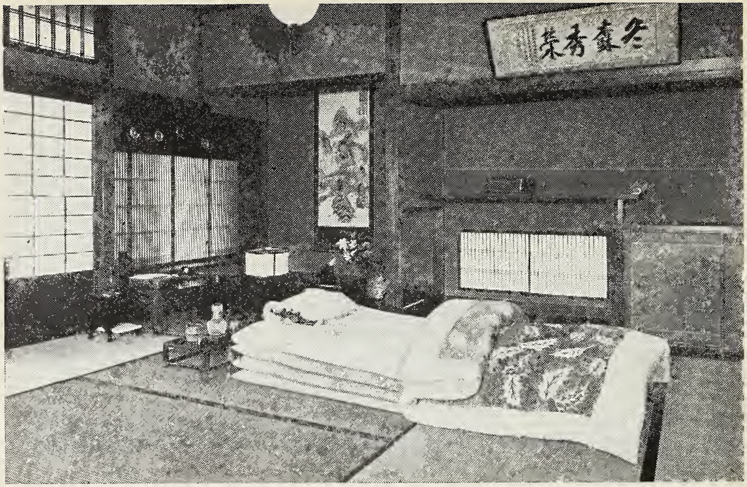


Chinese Wheelbarrow
with Sail.

the summer crop is still rice, the winter climate is only warm enough for wheat.



Chinese Hump-back Bridge.

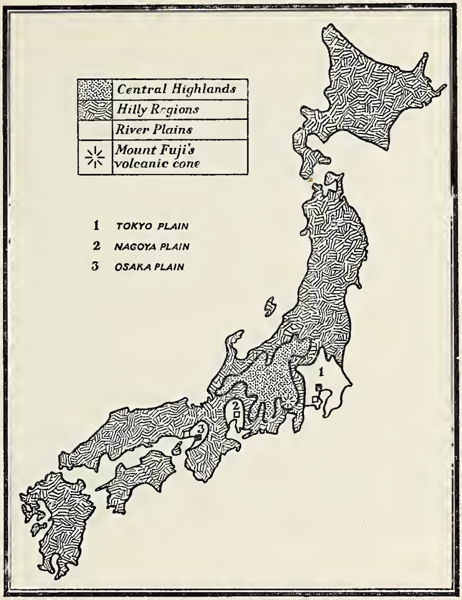


A Room in a Japanese House. How neat and airy is this room in the house of a well-to-do Japanese! The floor is covered with clean matting. A pile of mattresses, easily removed, serves as a bed. One painted screen on a wall, and one flower vase with a single spray of lilies, are sufficient for decoration. Two low tables and a cupboard provide all the furniture.

CHAPTER 29

THE JAPANESE EMPIRE

BETWEEN China and Japan lies Manchuria, detached from China by Japanese troops and made into the so-called kingdom of Manchukuo. For China it was a land of escape for her overcrowded people, who streamed into its empty northern spaces to settle there; for Japan it is a source of food and raw materials. Its central prairies are as fertile as the Argentine Pampas, its mountain borders are rich in coal, iron and timber. Though snow-bound for four months of the

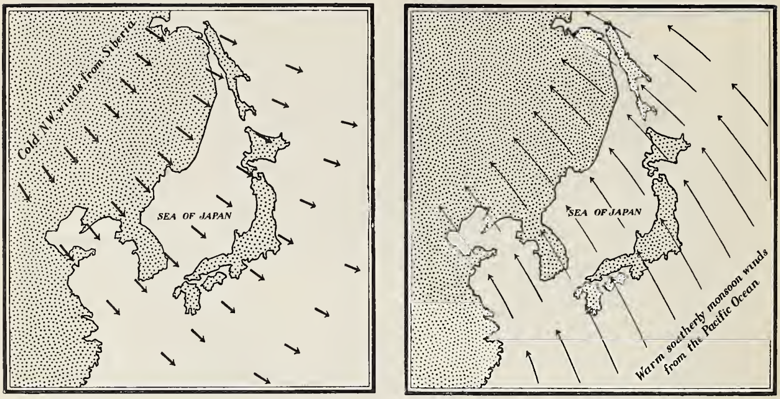


Surface of Japan. Compare with the map in the atlas. The islands are hilly with a mass of high mountains in the centre. Here are many active volcanoes as well as the sleeping Mt. Fuji. The few plains are merely the deltas of mountain rivers deposited in quiet bays. The three chief plains are marked on the diagram; the largest is Tokyo Plain.

year, its winter frosts cleanse and break up the soil, whilst summer rains and ample sunshine ensure good harvests.

As in North China, the food-crops are wheat and giant millet, but more important still is the soya-bean, which gives food for man and beast, oil for industry and manure for the soil. Mukden in the south is the centre from which Japanese business men control farms, mines, lumbering and shop-keeping.

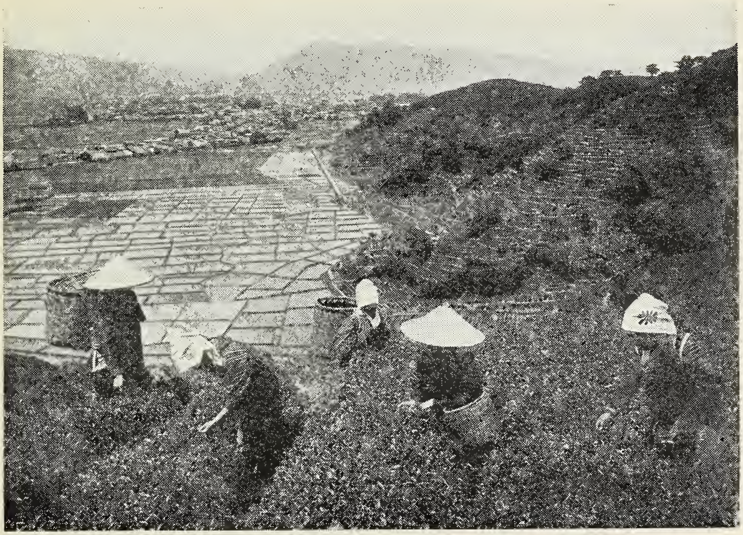
But control of Manchuria will not meet Japan's greatest need, an outlet for her population, for her people dislike the cold winter climate. Though the food problem is more serious in Japan even than in China, Japanese farmers are unwilling to emigrate. Even their own northern islands are too cold for them in winter, and Manchuria is worse, while Formosa (Taiwan), Japan's tropical possession, is too hot. Korea


Cold NW winds from Siberia
SEA OF JAPAN
SEA OF JAPAN
Warm southerly monsoon winds from the Pacific Ocean

Winds of Japan in January (Left) and July (Right). In winter the winds blow outwards from the continent and are cold and dry, though they give rain and snow to the mountains, especially on the western sides. In summer the winds are from south to east. As they blow from the Pacific towards the continent, rain is plentiful, and the winds are full.

(Chosen), which is also hers, might suit them, for there they can grow rice, the crop they understand best; but Korea is already full of Koreans, and there is little room for Japanese unless they remove the natives by force. Meanwhile the home population, already more crowded than our own in England, is increasing by nearly a million a year.

Japan is a land of mountains and small plains formed by river deltas. Though Mt. Fuji, its most beautiful and sacred volcanic peak, is now harmless, there are fifty others that may any day prove dangerous, and the country suffers much from earthquakes, hurricanes and floods. In winter it suffers, especially in the north and west, from Siberian winds; in summer it is warm and receives heavy rains from the Pacific



Scene in Japan. The picture includes a village in the distance, flooded rice-fields on the flat plain, terraced hill-slopes to the right and tea-pickers in the foreground.

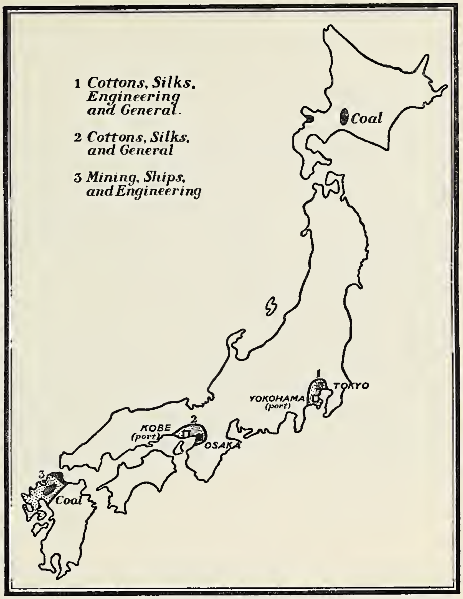
monsoon, particularly in the south. The resulting torrents have built the scattered plains and deltas with the waste from the mountains, yet barely a seventh of the whole surface can be cultivated. Terraced fields occupy every slope, and little more remains to be added by such means.

Fortunately the Japanese are content with little. We reckon that it takes four acres to support one man: in Japan two and a half acres are enough for a family of six. Their food includes neither meat nor milk, for cattle must give place to rice, the chief food of the nation. Their bamboo houses, with paper

Rice Harvest. Water now drained off (compare pictures, pp. 210 and 235).

screens for inside walls, seem flimsy to us, but they are sensible in a land of earthquakes. Rice-straw mats, on which they sit and sleep, are almost their only furniture and a single flower may be their only decoration. Gardens, indeed, are their delight, but they will build a whole dwarf landscape on a single tray. Their flower festivals follow each other from the blossoming of the almond till the time of chrysanthemums. Their holidays are humble pilgrimages to some mountain shrine.

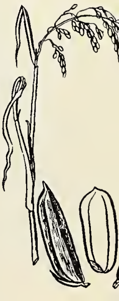
Rice and fish are the chief foods of Japan. The herring fleet is even more important to Japan than it is to England. Of fish at least there is an unfailing supply in the surrounding seas, but the home-grown rice must be eked out by importing more, as must our wheat in England. So to buy rice and the iron, cotton and other things she cannot find at home, Japan must


1 Cottons, Silks, Engineering and General.
2 Cottons, Silks, and General
3 Mining, Ships, and Engineering
Coal
1
TOKYO
YOKOHAMA (port)
2
KOBE (port)
OSAKA
3
Coal

Industrial Districts of Japan. The map shows three great industrial districts. Two are on the agricultural plains marked in the figure on p. 233, namely round Tokyo and Osaka. The third region lies along the strait which is the western sea-gate to Japan, has a coal-field on the south side, and large shipyards and engineering works.

make goods to sell abroad. More than half the population is partly engaged in producing silk, which is still woven for the most part on small hand looms. But large mills are used for cotton spinning, the raw material of which is imported from India and America, and the tall chimneys of Osaka recall the brick forests of a Lancashire town. They also use much electricity derived from the streams of the central mountains.

Raw silk and cotton goods are the chief exports of Japan. In their manufacture women are mainly employed at wages averaging about tenpence for a ten-hour day. They are drawn



Rice Plant and Seed.

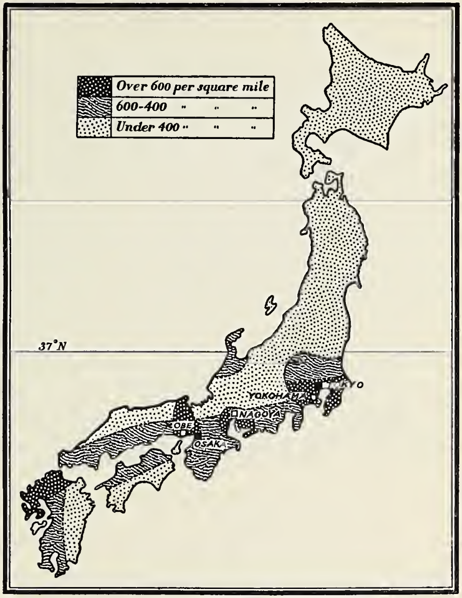
Herring Fishing. Fish are used for food, oil and fertiliser. More than a million Japanese are dependent directly or indirectly on the fisheries.

from the country districts and rarely work as much as two years in the mills, which means that unskilled hands must constantly replace them. At present Japanese cloth is mainly of the coarser kinds, selling at prices with which Western countries cannot hope to compete. Finer qualities will follow as the supply of skilled labour increases; and skilled labour will demand higher wages, but they will still be low compared with those paid in Europe.

Another trade that has made great strides in Japan is shipbuilding. Her ships already share the carrying trade of the world and help to earn the money that must be paid for food and raw materials.

The island loops that form the main Empire of Japan cover

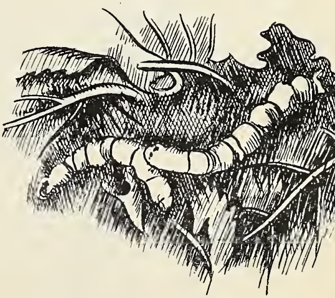
Distribution of Population in Japan. Most of the population lives in the warm south, and here too are the great cities and chief ports. The northern half has a long cold winter which the Japanese do not like.



the coast of Asia from South China to Kamchatka. Thus it extends from the Tropic of Cancer to the latitude of southern England; but all the chief islands lie between 30° and 40° N., which corresponds roughly to the Mediterranean.

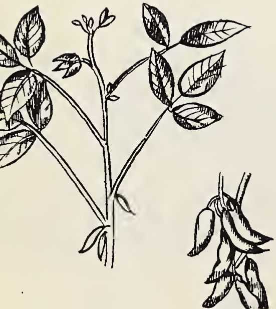
The likeness in position between Japan and Britain should be noticed. Each consists of a group of islands beside a continent from which it borrowed its earliest civilisation, and each looks out over a wide ocean. But Japan has come late into prominence. There are now no empty regions of the world to satisfy her needs, and those needs are more pressing than were England's in the days of her conquests and colonisation. Japan's position is a very difficult one and a source of anxiety to others as well as to herself.

The capital of Japan is Tokyo, centrally placed on the broadest plain of



Silkworms.

the main island and connected by a network of railways with every part of it. All the chief islands indeed are well supplied with railways. Tokyo has a population of two millions and takes on a more Western appearance with each rebuilding that follows a great earthquake. It lies at the head of a shallow bay, and ocean steamers must use its outport of Yokohama, where the chief foreign settlement of Japan is to be found. But since the last disastrous earthquake much trade has been diverted to the comparative safety of Kobe, a rising port with active shipbuilding yards, lying on the shores of the beautiful inland sea of Japan.



Soya Bean.

Rice-Growing in Siam. In the backgound is a herd of buffaloes, which commonly are used to pull the ploughs. Though heavy animals, they have broad spreading pads to their feet and these enable them to pull in the soft mud of the rice-fields. But, slowly, more modern Western methods are invading these old Eastern countries; a tractor is seen at work ploughing three furrows instead of one.

CHAPTER 30

EAST AND WEST

OUR spiral journey round the world will take us now a second time across the Pacific, this time on a northern course.

We have seen little as yet of Northern Asia, which is wholly Russian and cannot be dealt with apart from the European territory of that nation. But the lands to the south and east of the mountain and desert barrier deserve to be looked at as a whole before we sail for North America.

It must have struck us in each country we have recently visited that we had to deal with something quite different from the southern continents. The Asiatic countries, in the first place, were already full before modern Western peoples came in contact with them. This is true even of the dry south-western regions of Asia, which contain about as many people as they can well hope to feed. It is truer still of the monsoon lands further east, where half the population of the world supports itself on one-eighth of the world's land surface. Here then there is little chance of finding permanent homes for Western colonists. If some countries of Europe are overcrowded, the case is far worse in Eastern Asia.

Secondly, these Oriental lands have their own ancient civilisations and look with suspicion on many ideas which the European feels no doubt about at all. The Oriental is not usually impressed with the importance of getting rich: comfort, which we think so much of, seems a small thing to the Oriental, and speed appeals to him not at all. His life is simpler, though not on that account unhappier, than ours, and therefore he asks less wages. His ideas of amusement, again, are different, and little of his small earnings go to provide him with it. It is plain that people who are content with so little can produce goods more cheaply than we, with our Western standards of living, can hope to do. The more Asiatic nations manufacture, the more difficult we shall find it not only to sell them things as we did before, but also to sell our products as cheaply as theirs in other countries.

And we must not forget the great difference in climate between the monsoon lands of Asia and the countries of Western civilisation, both north and south of the equator. With this is bound up the difference of food. Western civilisation is based on wheat and meat, that of monsoon Asia on rice.

There can be no doubt that of all grains wheat has the greatest food value and rice the least; nevertheless rice in a warm climate, where less food is required, has proved amply sufficient for human needs, though greater quantities of it must be eaten. This in itself is a drawback in densely peopled regions, and more interest is now being shown in wheat, wherever wheat can be grown. But in lands which are visited by the heavier monsoon rainfall, wheat cannot flourish.

The absence of pasture-land which we have noted in various countries is not, from the food point of view, a serious drawback. Flesh food is unnecessary and even harmful in warm climates, and meat production is in any case the most extravagant way of using the soil. Milk production, as in Europe, is another matter.

It is due to the warmer climate that the inhabitants of lands within the Tropics are less energetic than people who live further north or south. We do not find in India, Indo-China or South China the same endurance and energy as we find in North China or Japan, where the cold winters are at least as bracing as our own. These are the countries that are producing, or will produce, our most serious rivals.

Our own debt to the East must not be lost sight of. We have to thank it for such valuable discoveries as ink and paper, the mariner's compass, the use of silk and tea, and Arabic numerals. Chinese and Japanese porcelain and lacquer-work, the Persian games of chess and polo are among the sources of pleasure we owe to the East.

Many Eastern countries in later times have been quick to learn from the Western world the things they thought most useful. They admire and copy, or try to copy, many of our Western ways of government and education; they have adopted very readily our methods of warfare, because they realised that without them they would be at a disadvantage, and they have welcomed our inventions in science and machinery and fitted them to their own needs. They have been less willing to accept our religious ideas, because, unlike the simpler races of the Southern Hemisphere, they have great religions of their own.

It is true also that the great religions of Asia—Mohammedanism, Hinduism, Buddhism—and the various religions of China contain in their purest forms many truths which come to us from Christianity. The best moral teaching of the East is, in fact, as high as any in the West, though that teaching reaches only a small part of the population. Of Eastern religions (if we forget, for the moment, that Christianity came from the East) only Mohammedanism has been energetic in making converts, and Mohammedanism tends to encourage the virtues not of peace, but of war. Far different is the teaching of Buddha:

This is peace
To conquer love of self and lust of life,
To tear deep-rooted passion from the breast,
To still the inward strife; . . .
To lay up lasting treasure
Of perfect service rendered, duties done
In charity, soft speech, and stainless days:
These riches shall not fade away in life,
Nor any death dispraise.

EDWIN ARNOLD: *The Light of Asia.*

MAN THE WORLD OVER

PART TWO

MAN THE WORLD OVER

PART II

CHAPTER 1

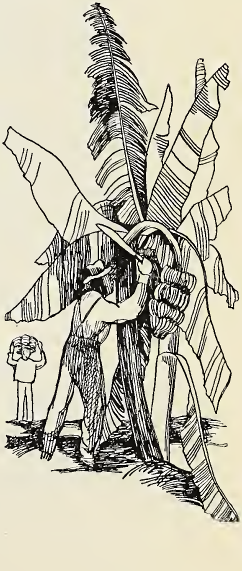
EDEN, LIMITED

> O the palms grew high in Avès, and fruits that shone like gold,
> And the colibris* and parrots they were gorgeous to behold. . . .
> And such a port for mariners I ne'er shall see again
> As the pleasant Isle of Avès, beside the Spanish Main.
>
> Charles Kingsley, *The Last Buccanier.*

OUR second journey round the world brings us once more across the Pacific Ocean to Central America and the West Indies. We might call this region Skeleton America, for little remains above water but the mountain backbone of the " Spanish Main " and some broken ribs between Florida and the Orinoco mouth. Yet these broken ribs of the West Indies are the tops of mountains as high as the Andes. The land from which they rise has sunk to great depths and is covered by an almost enclosed sea, similar to the Mediterranean. It is divided into the Gulf of Mexico and the Caribbean Sea.

The name West Indies recalls the East Indies of Asia, a similar group of mountain tops rising from the sea. But the West Indies lie further north. Their climate is not so hot, the vegetation is more varied, and the scenery is probably the most beautiful on earth.

This region was discovered by Columbus in 1492, and for 300 years the mainland and the larger islands belonged to Spain. The gold and silver mines of Mexico were the richest in the world till those of Peru outshone them. Today the



Cutting Bananas.

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* Generally known as humming-birds.

High Islands. In contrast to a low coral island this (part of Jamaica) is more massive and mountainous, darker in colour. For coolness' sake houses of the wealthier inhabitants are built high up, on ledges cut out of the mountain-side; roads climb steeply. Kingston harbour and the sea are visible in the distance.

white population is still mainly Spanish, the language spoken is Spanish, and the religion is Roman Catholic.

Other nations—British, French and Dutch—got possession of the smaller islands and grew rich crops of tobacco, cotton and sugar-cane on their fertile soils. But the government was weak, and for many years buccaneers and pirates preyed on the shipping of the Caribbean Sea, staining its lovely beaches with endless bloodshed.

Spain's Central American colonies are now seven separate mountain republics. The largest is Mexico; the most prosperous is Costa Rica, for that alone was settled by Spanish peasants who worked their own farms. Costa Rica's chief crops are coffee and bananas, which are sold to the United States and Great Britain.

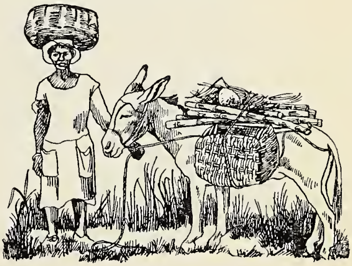
In the other republics large cattle-ranches are the rule, with wealthy white owners and poverty-stricken Indian labourers, whose discontent causes many rebellions. Up and down the low, wet eastern coasts foreign companies grow vast crops of bananas for the United States.

Mexico still supplies a third of the world's silver, and much oil comes from the Gulf Coast behind the port of Tampico. The capital is Mexico City, a modern town on the high dry plateau 7,000 feet above the sea. It has a million inhabitants.

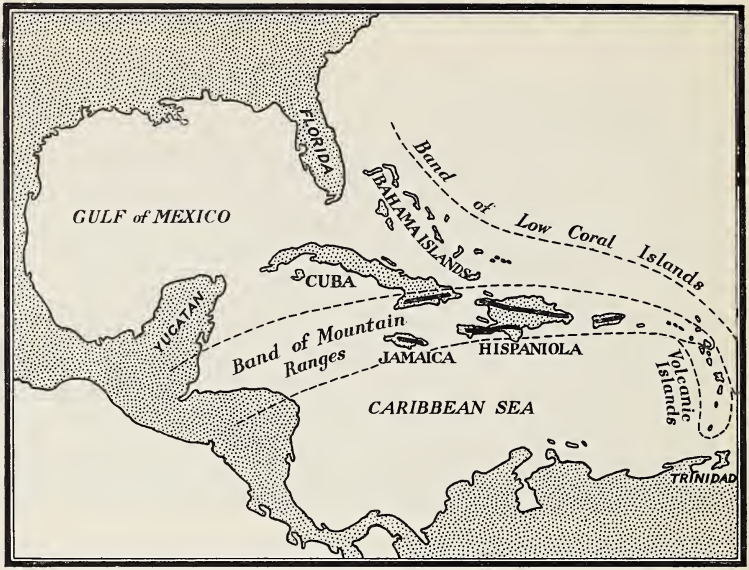
Before the Panama Canal was cut, the Caribbean was a blind alley of the Atlantic. The canal has made it a world thoroughfare, to the great advantage of its ports. The western states of South America have also benefited; but clearly the United States have gained most by this short cut from their eastern ports to the Pacific.

The Tropic of Cancer runs between Florida and Cuba. The islands and Central America lie therefore in the Hot Belt, but the steady breezes of the North-East Trade Winds bring cooler weather to the eastward coasts, and the interior highlands are also not too hot. This has made white settlement possible and even attractive. But the proportion of white to black or "coloured" inhabitants is very small.

West Indian crops are tropical, and the conditions are unsuitable for white labourers. The native Caribs never took kindly to field work and have perished, leaving only their name to the Caribbean Sea. Negro slaves were brought from West Africa, and their descendants form the main population of the islands today. But once they were freed, they showed little inclination to serve as hired labourers, and East Indian coolies have been imported to work on the sugar plantations of some islands.

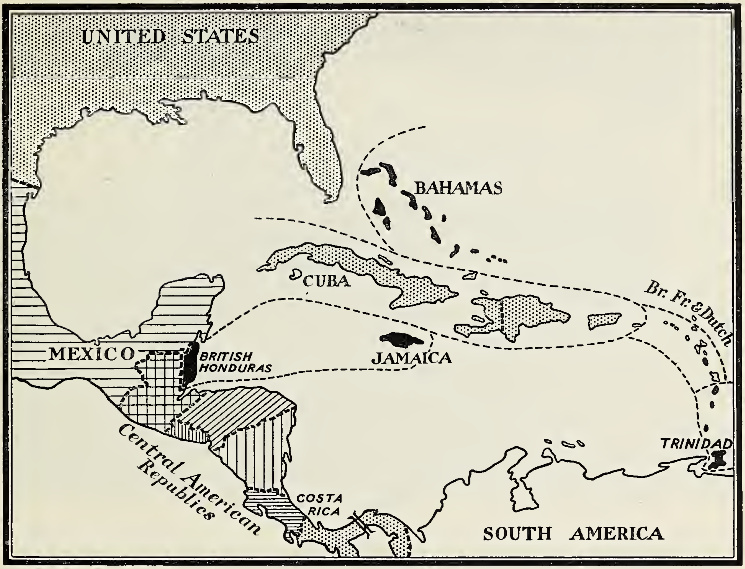


Primitive Transport.


GULF of MEXICO
FLORIDA
BAHAMA ISLANDS
Band of Low Coral Islands
CUBA
YUCATAN
Band of Mountain Ranges
JAMAICA
HISPANIOLA
Volcanic Islands
CARIBBEAN SEA
TRINIDAD

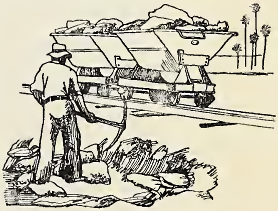
The West Indies. The three kinds of islands are shown, (*a*) the larger mountainous islands, the tops of mountain ranges extended from the Central American mainland; this is flanked by (*b*) a band of low coral islands on the outside from the Bahamas to Barbados and (*c*) high volcanic islands on the inside of the curve.

It was the sugar-cane with its by-products, molasses (or treacle) and rum, that brought these islands their early wealth. Then the growing of the sugar-beet in Europe and North America, coupled with the freeing of the slaves a hundred years ago, struck the West Indies a blow from which they have never recovered. They had no second crop to rely on. Nowadays Jamaica exports 25 million bunches of bananas yearly. Cuba still finds a good market for her sugar in the United States and has a valuable trade in cigars. Trinidad is fortunate in growing cocoa as well as sugar and in


UNITED STATES
BAHAMAS
CUBA
Br. Fr. & Dutch
MEXICO
BRITISH HONDURAS
JAMAICA
Central American Republics
TRINIDAD
COSTA RICA
SOUTH AMERICA

Political Connections of the West Indies. Although owning only Puerto Rico and the Panama Canal Zone, the United States controls most of the trade in the Central American Republics and in the larger islands which are dotted. British possessions are shown in black and include (*a*) Jamaica and British Honduras, (*b*) the Bahamas, (*c*) Trinidad, (*d*) most of the Lesser Antilles.

having valuable supplies of oil and asphalt. The full extent of these oil fields is as yet unknown, though 1,500 wells have already been opened. The asphalt comes from a natural Pitch Lake about half a mile wide and 200 feet deep. The surface is solid except in the centre, where the pitch is always bubbling. It is hacked out in blocks and carried on narrow-gauge railways laid on the surface of the



Hacking Pitch.

Crushing the Cane at a Sugar Mill. Brought to the crushing house by donkey, cart, lorry or narrow-gauge railway, the canes are tipped on to a moving " conveyor " which carries a continuous supply to the crushing machines. The cane is passed between heavy rollers, which grind it up and squeeze out the sweet juice.

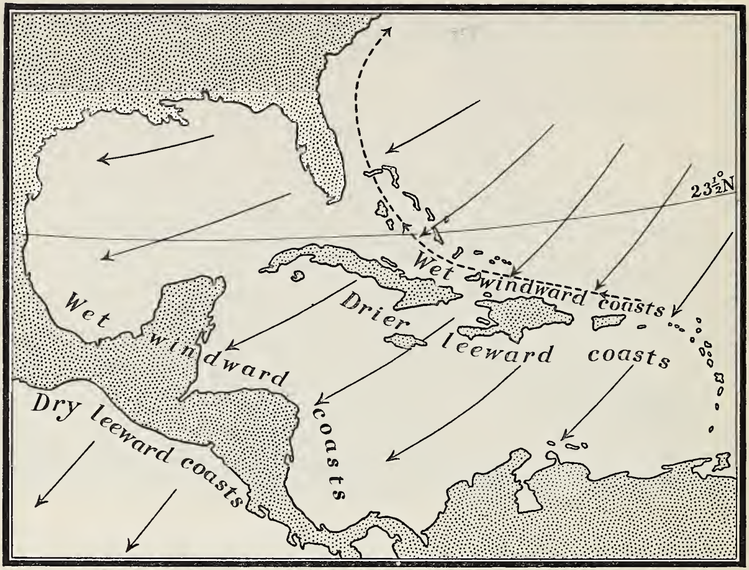
lake to the refineries, where it is heated and run into barrels. During forty years of digging the surface has only fallen 20 feet, so the supply will last many more years. Trinidad is the greatest producer of petroleum in the British Empire, and its natural asphalt has no equal in the world.

For all its natural beauty this region has never been a perfect Paradise. Men have sadly misused it, and even Nature herself seems sometimes to repent of her kindness. Earthquakes, volcanic eruptions and hurricanes bring ruin upon these pleasant lands.

In January, 1907, a large part of the town of Kingston in Jamaica was destroyed by an earthquake. " It began,"

Boiling-vats in a Sugar Mill. The juice is slowly boiled down in large vats until it becomes thick and syrupy and crystals of sugar form. It is then placed in " drums " which turn at high speed. The syrup is thrown out through holes in the sides to become molasses or treacle; the raw sugar is left behind in the drum. When purified still further, both are ready for market. A third product is "Jamaica" rum which is fermented from molasses.

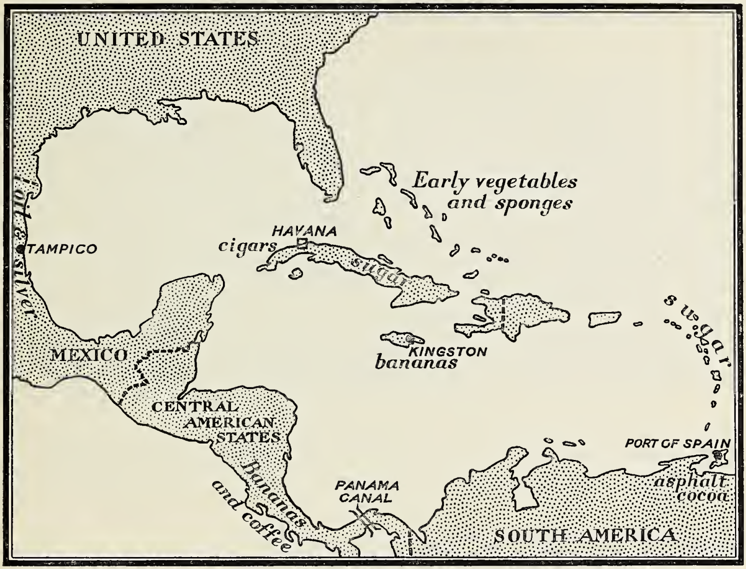
wrote one who felt it, " with a savage tearing and rending noise. The next instant the whole house was rocking violently, and a shower of brickwork fell. A cloud of dust and mortar darkened the air. The solid 14-inch wall swayed to and fro. A lump of masonry struck me a numbing blow on the shin. . . . We were being bombarded both front and rear, but we were unable to fly, for the timber floor was like quicksand beneath the feet, rising and falling, and opening and shutting, so that we could see into the room below." Then, just as the house was about to collapse, " with absolute suddenness the



The North-East Trade Winds of the West Indies and Central America. The north-east trades (long arrows) are steady stiff breezes and blow from an easterly direction for ninety days out of a hundred. They bring a refreshing coolness and, to the high islands, give heavy rains (and forests) on windward coasts. The regularity of this climate is sometimes suddenly disturbed in late summer by tropical hurricanes. They come down from the east and, passing across the islands, curve northwards (as suggested by the line of broken arrows) to skirt the coast of the mainland, spreading terror and doing immense damage to crops and buildings.

quaking floor stiffened beneath our feet. Everything became still again, and the noise of the earthquake died away." Is it surprising that people " never get used to earthquakes "?

Still more awful was the eruption in 1902 of Mount Pelée in Martinique. After fifty years of quiet, the volcano began to spout steam, and the glow from the crater lit up the sky, causing wide-spread terror. Clouds of hot dust fell on all the country-

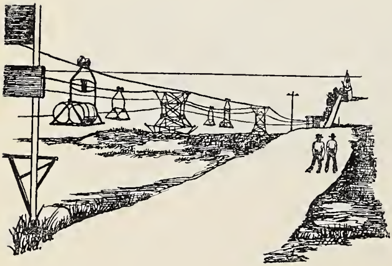

UNITED STATES
Early vegetables and sponges
HAVANA
cigars
TAMPICO
oil & silver
sugar
KINGSTON
bananas
MEXICO
CENTRAL AMERICAN STATES
sugar
PORT OF SPAIN
asphalt
cocoa
PANAMA CANAL
Bananas and coffee
SOUTH AMERICA

Some Chief Products of the West Indies and Central America. The main crop of the islands is sugar, but note those islands which have more than one export product, especially Cuba, Jamaica, Trinidad and the Bahamas. The sponge fisheries of the Bahamas are the largest in the Empire. Mexico has important minerals, silver and oil.

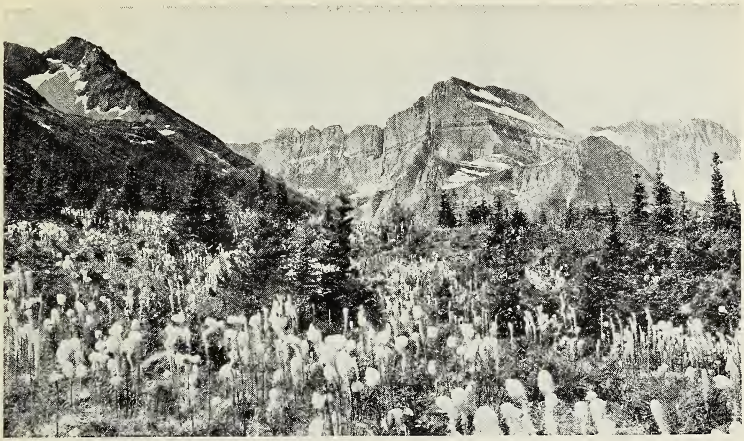
side. A week later a terrific explosion split the mountain-top, a column of dark steam rose high into the air, and rocks and stones rained down from the crater. Darkness covered the land, lit by lightning flashes sixty to the minute, while the thunder roared, and black rain descended in torrents. A stream of boiling mud and lava, half a mile wide, rushed down the mountain-side, engulfing sugar mills and even melting their metal rollers. A huge poisonous cloud swept over the doomed town of St. Pierre. The houses were shattered, the ships in the harbour destroyed—all but one, which had enough steam up to get to sea. One suburb of the town lay outside the path of destruction; the rest was a burning ruin, and in a few minutes 28,000 people were dead or dying.

More frequent than earthquakes or eruptions are the hurricanes. They may be expected in the " hurricane months," September and October. They are whirling storms, sometimes 100 miles wide, which come in from the east and usually curve northwards past the coast of Florida. Torrential rain and deafening thunder-claps accompany a wind which may be travelling nearly two miles a minute. Roofs are carried away like straws, and wooden houses blown to matchwood. The din is increased by the crackling of electric wires and the crash of uprooted trees. At sea the gale raises mountainous waves; and the water may sweep far inland, as on the Florida coast in 1926, carrying ships with it, flooding towns and villages and doing enormous damage to life and property. Though hurricane signals from the weather stations warn both ships and people ashore to take shelter before the worst arrives, a hurricane is always a terrifying experience.

And now, perhaps, you will understand the title of this chapter !



Cable Conveyor for Loading Pitch.



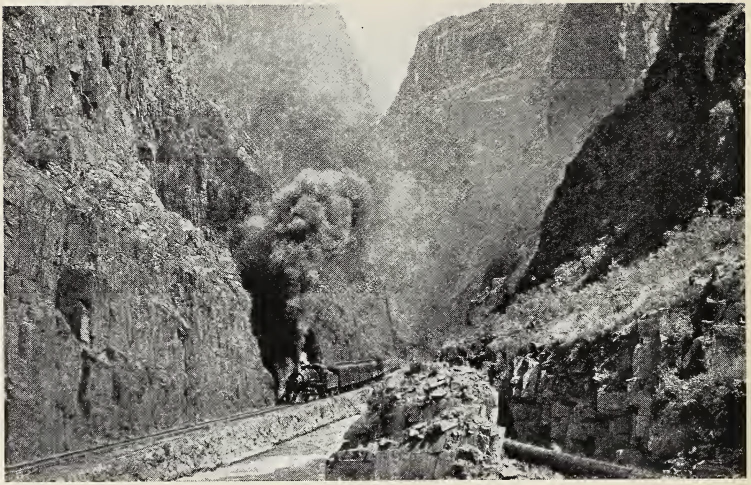
The Rocky Mountains. Summits are high (over 14,000 feet) and jagged; sides are steep and bare or snow-covered. Coniferous trees, like Christmas trees, cover the lower slopes; in the foreground an open patch has coarse tufts of " bear grass."

CHAPTER 2

MOUNTAINS, PLAINS AND RIVERS OF NORTH AMERICA

THE backbone of Central America, which widens to form the Plateau of Mexico, stretches northwards, broad and high. It covers, between the Pacific Coast and the Rocky Mountains, a third of the width of the United States. In this broad section the snow-clad ranges are separated by wide plateaus and high basins; its rivers have carved deep valleys and canyons.

On the east side of the continent the Appalachian Mountains are much lower—scarcely higher than our Welsh and Scottish Highlands. They are also less jagged than the Rockies, and their valleys are more open. Northwards they



A Canyon in the Rocky Mountains. Just as the mountains are high and rugged, so the valleys are deep and rocky, and the rivers are fast and noisy. It is only by such canyons that the railways get through the mountains, and, even so, a ledge for the rails has to be blasted out of almost sheer walls.

form peninsulas and islands in the Atlantic, such as Nova Scotia and Newfoundland, or bays and straits such as the Bay of Fundy and Cabot Strait.

Between the Rockies and the Appalachians lies a broad central lowland from Hudson Bay to the Gulf of Mexico. But the northern half differs widely from the southern. Long ages ago, when the climate was far colder, an ice sheet, thousands of feet thick, crept southwards over Canada, scraping, smoothing its rocky floor as far as the Great Lakes and the St. Lawrence River. As it moved, the ice gouged many hollows in its rocky floor and blocked old river valleys with mud and rocks. So, when the climate grew warmer and the ice disappeared, lakes filled the hollows and the blocked valleys;

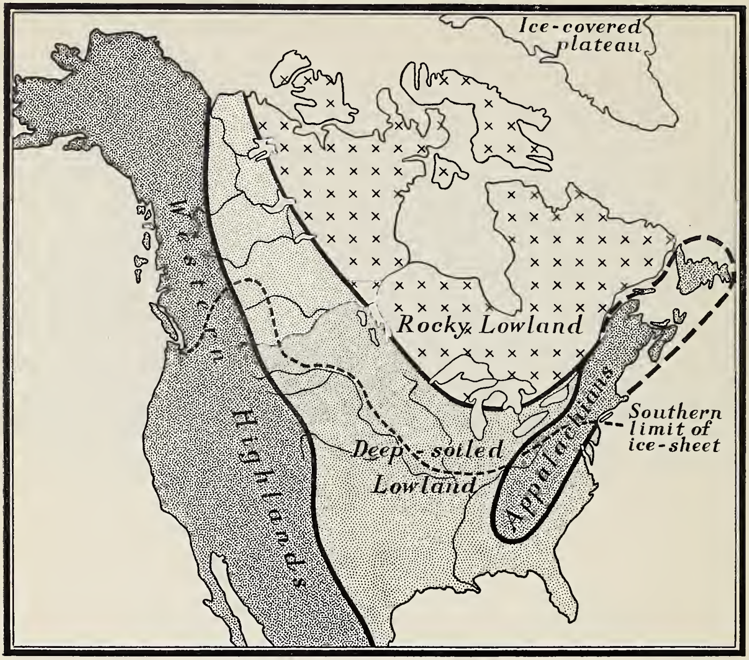
The Appalachians are lower and worn smoother than the Rockies. Summits here are more even and slopes are gentler; much mountain is covered with forest to the summit and no bare rock is visible. The valleys seen in the picture are wider than the valleys of the Rockies, and there the forest has been cleared for farms.

and rivers flowed once more, though often interrupted by falls and rapids. These rivers form three main systems, draining by the Mackenzie to the Arctic Ocean, by the Nelson to Hudson Bay, and by the St. Lawrence to the Atlantic.

This ice-smoothed region is called, from its shape, the Canadian Shield. Much of it, indeed, is bare rock on which no farmer could find a living; but it is immensely rich in minerals, forests and water-power (see the picture on p. 262).

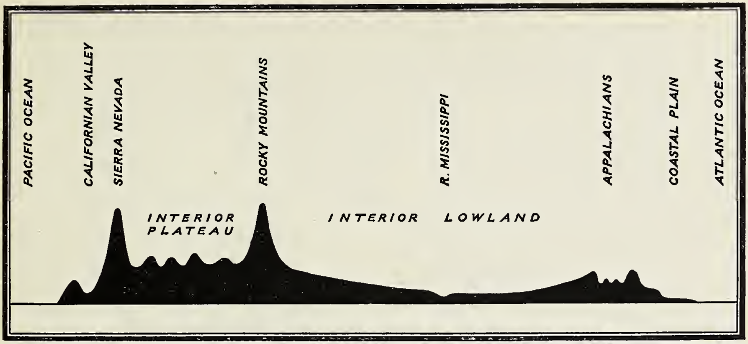
West and south of the " Shield," on the other hand, there is a deep covering of soil. Part of this region forms the natural grasslands which the early French explorers called " prairies," and under the name of the Great Plains these prairies rise steadily westwards towards the Rocky Mountains.

In the southern part of the central lowland the rivers are gathered in by the Mississippi, " the Father of Waters," as


Ice-covered plateau
Western Highlands
Rocky Lowland
Deep-soiled Lowland
Appalachians
Southern limit of ice-sheet

Surface Divisions of North America. (*a*) The broad trough-like Central Lowland from Hudson Bay to the Gulf of Mexico is enclosed between (*b*) the high rugged western highlands of which the Rocky Mountains form the eastern margin, and (*c*) on the east the much lower Appalachian Highlands. The figure shows also the northern and southern divisions of the Central Lowland, as described in the text. The thin broken line marks the southernmost limit reached by the ancient ice sheet. Compare this closely with the physical map in the atlas.

the Indians called it. Rising west of Lake Superior, it flows south through a narrow valley, falling here and there over rocky ledges which make it useless for traffic. The last of these falls gives water-power for the flour-mills of Minneapolis.

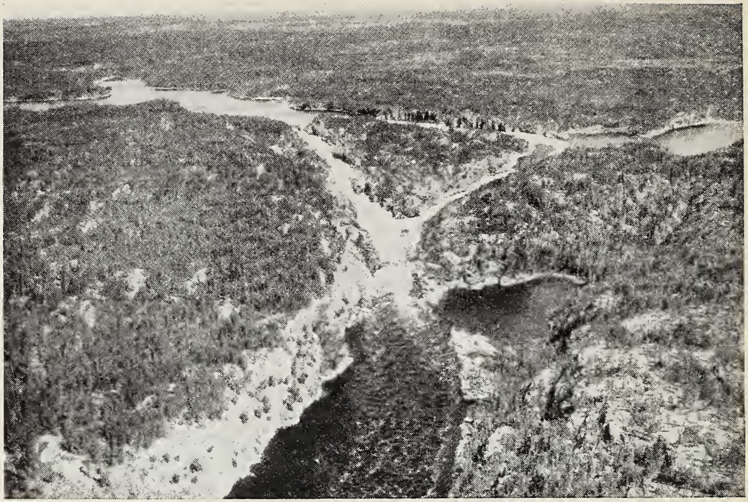

PACIFIC OCEAN
CALIFORNIAN VALLEY
SIERRA NEVADA
INTERIOR PLATEAU
ROCKY MOUNTAINS
INTERIOR LOWLAND
R. MISSISSIPPI
APPALACHIANS
COASTAL PLAIN
ATLANTIC OCEAN

Section West to East across the United States, showing the western mountain ranges and plateaus between them, the Central Interior Lowland, and the eastern Appalachians. Note that the Rocky Mountains are not near the Pacific Coast, but a third of the way across the Continent, and that they are much higher than the Appalachians. Compare closely with the map in the atlas and find the names marked on the section. The heights, of course, are much exaggerated.

Then the river becomes navigable, running strongly for 700 miles till it meets the Missouri. At St. Louis, just below the junction, the Mississippi is a mile wide and nearly 100 feet deep, although it is still 1,200 miles from the sea. But the current is now slow, too slow to carry the heavy load of mud brought down by its longest tributaries, the Missouri and the Ohio. So much mud settles on the bottom and the banks that in course of ages the Mississippi has raised its channel 10 feet or more above the rest of the valley.

With slow current the river swings in huge bends and loops as it travels down its wide valley. But in flood-time the force of the stream at a sharp bend may break a way across the neck. Such " cut-offs " leave the old bend a mere " horse-shoe " lake or swamp and transfer many square miles of land from one side of the river to the other.

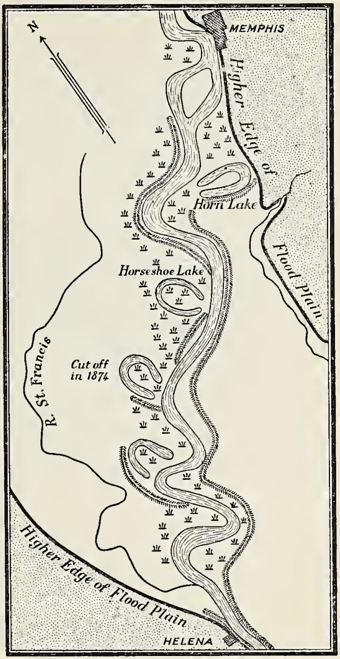
The floods of January, 1937, were the worst ever recorded. Very heavy rains caused the Ohio to rise 10 feet above the



The Work of the Ice Sheet. The general appearance is a lowland with gentle flowing outlines. The surface has been smoothed by ice, and much bare rock is exposed. The forest of pines and firs is thin, because trees can find a root-hold only here and there in cracks and crevices of the rocks. The river, dividing and reuniting and swirling into pools, flows steadily at the top of the picture, falls over a rocky ledge, and then races along in wild rapids towards the observer. (See text, p. 259.)

highest level ever known and made it a vast lake 15 miles wide. Towns were flooded, and many people were drowned. The damage was enormous, but the loss of life would have been greater had it not been for the wireless. In five days, warned by wireless and telephone, waiting boats rescued 58,000 people from their flooded homes.

The peak of the flood, 80 feet above the ordinary water-level, took a month to pass down from Cincinnati to New Orleans. The pressure on the dykes or "levees," built to strengthen the banks in dangerous places, was enormous, but

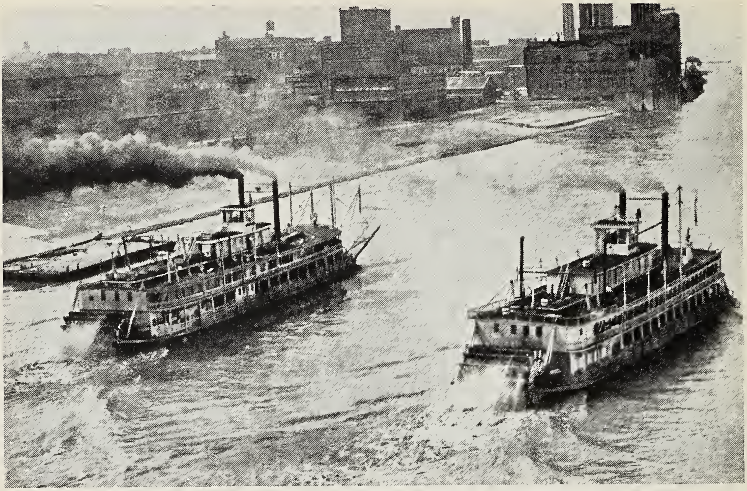


Part of the Flood-Plain of the Mississippi. The distance from Memphis to Helena is about 50 miles. How wide is the flood-plain? The river swings across its valley, often in great loops. Since its bed is several feet above the surrounding land, the St. Francis River flows for 40 miles before it can join the main river; floods, too, may be disastrous in spite of the artificial embankments shown. There is much swamp, and the two towns are built high above flood danger. In flood-times the river has cut across the necks of several loops, straightened its course and left the bends deserted as horse-shoe lakes, of which two are named.

warnings were telegraphed ahead. Armies of men with sandbags were rushed to weak points in the levees, and fleets of launches, cars and lorries were gathered for rescue-work. Thus the Mississippi was saved from the worst disasters of the Ohio. But wherever the banks are broken by the pressure of the river, the water swamps the lower lying bottom-lands, drowning crops and cattle and bringing ruin to their owners.

The region round New Orleans is the delta which the Mississippi has built with its mud in the Gulf of Mexico, and the " goose-foot " of its mouths or " passes " shows where the process is still slowly continuing. It is reckoned that the floods of 1937 washed down many million tons of crop-soil into the Gulf (see next page).

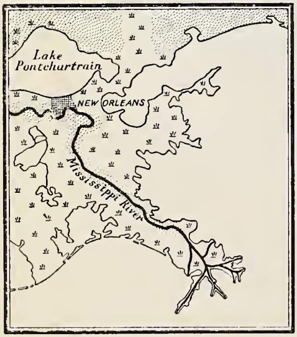
For the first half of the nineteenth century the Mississippi was a busy waterway, and strings of barges carrying coal and



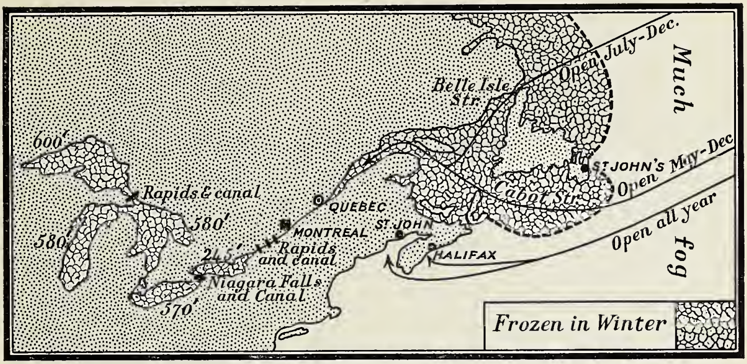
Mississippi Steamboats at St. Louis. The steamboats are three-deckers with the captain's " bridge " on the top. The vessels are broad and flat-bottomed so that they draw little water, even when heavily loaded, *e.g.* with cotton bales. The broad paddle-wheel is placed at the stern.

cotton are still drawn by stern-wheel steamers down to New Orleans. But the main traffic of the United States is now carried by the railways east and west across the continent.

The case of the St. Lawrence is very different. With the five Great Lakes through which it flows, it opens a waterway into the heart of the continent in the direct line of traffic from Europe. The railways, so far from reducing its importance, have increased it by bringing merchandise, wheat, iron ore and coal to its harbours for the cheaper transport it offers. The lakes are inland seas with shipping services of their own, but they are also reservoirs for the St. Lawrence. Their size ensures an even



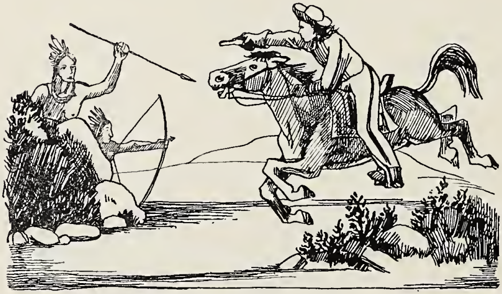
Mississippi " Goose-Foot."


Belle Isle Str.
Open July-Dec.
Much fog
600'
Rapids & canal
580'
580'
QUEBEC
MONTREAL
ST. JOHN
ST JOHN'S
Open May-Dec
Cabot Str.
245'
Rapids and canal
Niagara Falls and Canal
570'
HALIFAX
Open all year
Frozen in Winter

The Great Lakes and the St. Lawrence: Steamer Routes and Difficulties of Navigation.

flow of water into the river, since it requires torrential rains or an extraordinary drought to raise or lower their surfaces by even a few inches. The floods caused lower down are never dangerous. Moreover the absence of a swift current through the lakes allows the mud which they receive to be dropped before it can enter the lower river, and so prevents it from becoming a second Mississippi.

Nevertheless the waterway is not without its drawbacks. The outfall of Lake Superior drops 20 feet into Lake Huron over a series of rapids. Lake Erie is 250 feet above Lake Ontario, and between them lie the famous falls of Niagara. Below Lake Ontario there is an equal though less sudden drop, and the rapids prevent large ocean steamers getting higher than Montreal. A system of canals, however, enables ships of moderate size to pass these obstructions. But from December to April navigation both on the lakes and the river is closed by ice. The approach to Canadian ports from the Atlantic is at times dangerous owing to fogs and icebergs. Fogs occur when south winds bring warm moist air off the Gulf Stream and mix it with the cold air over the Labrador Current. Icebergs are broken off from the ends of West Greenland glaciers as they push their snouts out into the sea. They are carried southwards by currents in early summer. Every ship's captain, before he starts a voyage, finds out from a chart in harbour where icebergs have been reported. And an ice-patrol cutter not only warns vessels of their presence by wireless but hastens their melting by breaking them up with explosives.



The Pony-express (p. 274).

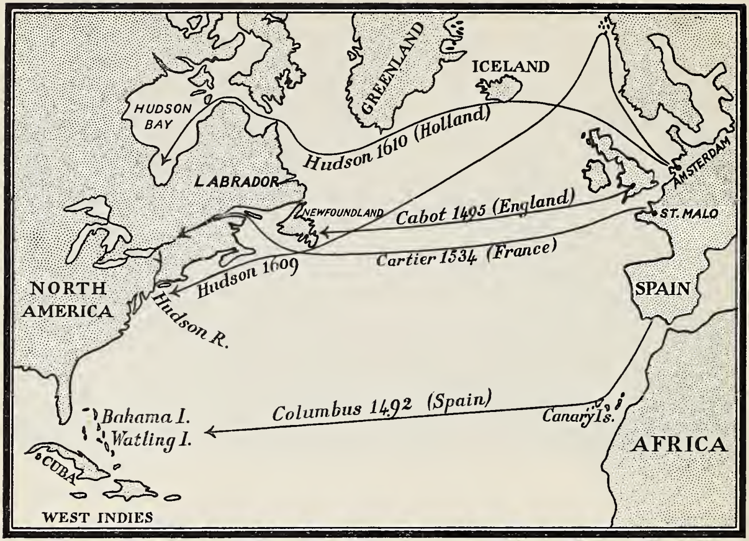
Indians. Although a present-day photograph, the picture shows a group of Indians, some with the peace pipe and the war-bonnet of eagles' feathers. The tent or tepee consists of a framework of poles held together at the top and covered with skins or canvas; on the outside is painted a buffalo hunt. Birch-bark canoes are at the river-bank.

CHAPTER 3

NORTH AMERICA: THE PIONEERS

THOUGH the Spaniards discovered America, the exploration and settlement of the land was the work of other nations. English merchants sent out John Cabot, who discovered Canada, but the exploration of the St. Lawrence was the work of a Frenchman, Cartier. So it was the French who colonised Lower Canada (the Province of Quebec) in which there are now 3 million French-speaking Canadians.

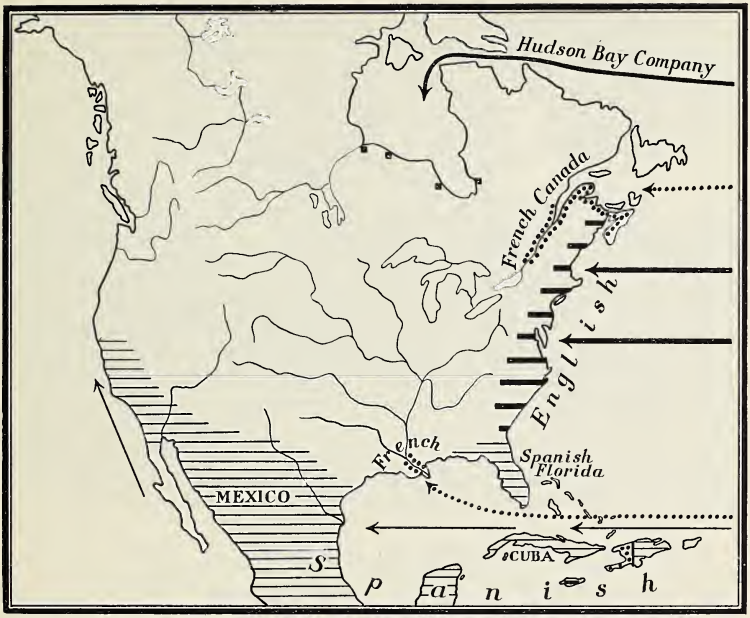
Further south, the Dutch were the first to occupy the


HUDSON BAY
ICELAND
GREENLAND
Hudson 1610 (Holland)
LABRADOR
AMSTERDAM
NEWFOUNDLAND
Cabot 1495 (England)
ST. MALO
Cartier 1534 (France)
Hudson 1609
NORTH AMERICA
Hudson R.
SPAIN
Columbus 1492 (Spain)
Canary Is.
Bahama I.
Watling I.
CUBA
AFRICA
WEST INDIES

Early Seamen Explorers. Four countries sent out these early navigators, as described in the text. All were searching for a westward sea-passage to the East Indies. Hudson wanted to try eastwards, but his crew refused.

Hudson Valley. But the English settlements, which began in Virginia and New England, soon spread along the coast, and the Dutch were forced to surrender their claims to the Hudson River. Upstream from New York Harbour, that river leads to the best approach to the St. Lawrence from the south. But it also leads to the valley of the Mohawk, a western tributary of the Hudson. This is the easiest route across the Appalachians from the Atlantic seaboard to the Central Lowlands (map, p. 309).

When Europeans first reached North America, there were about a million Indians in the whole country, where now there are nearly 135 million inhabitants. They were an in-



European Colonists of North America. The early colonisers of the continent came mainly from Spain, England, and France. First the Spaniards (thin arrows) founded settlements in the West Indies and on the mainland. Except Mexico, those on the mainland now belong to the United States (though Spanish names of places, like San Francisco, still remain). French colonists (dotted arrows) entered the two river-mouths that opened towards the Atlantic, the Mississippi and the St. Lawrence. Between French in the north and Spaniards in the south the English settled all along the Atlantic seaboard, though the Dutch were on the Hudson River before them.

telligent race, though they knew the use of neither wheels nor iron and the dog was their only domestic animal. Some tribes grew maize, the only Indian corn, but hunting provided their chief food supply.

The Covered Waggon. Wooden hoops fit into rings on the outside of the " box " of the waggon and are covered with canvas. The cover, of course, provides shelter for both the family and their belongings. Note the " Mexican " saddle on the left. What are the " horn " and " lasso " for?

Further west, other tribes hunted the bison, which roamed the grassy prairies in vast herds.

> " Unmolested roved the hunters,
> Built the birch-canoe for sailing,
> Caught the fish in lake and river,
> Shot the deer and trapped the beaver."
>
> *Hiawatha.*

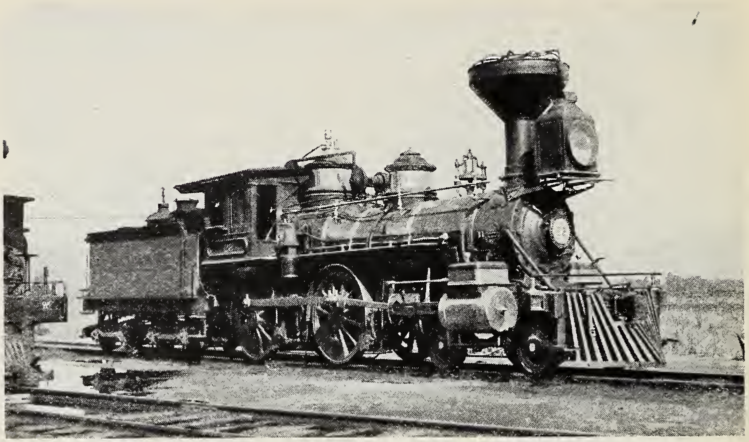
The French stayed mostly on their farms in Lower Canada, though their missionaries, hunters and trappers showed the utmost daring in exploring the Great Lakes and rivers, by which alone they could make their way into the trackless wilderness.

The Hudson-Mohawk passage soon brought the British colonists to the Great Lakes and the French outposts. The rivalry of the two European nations ended in the British capture of Canada, whose French *habitants* became as loyal subjects of our King as the Dutch of South Africa are today. It was the *British* colonists who found reason to rebel and set up the independent United States.

Slowly but steadily the frontier of settlement moved westward. Through and round the Appalachians, down the Ohio and its tributaries, the pioneers advanced, seeking new homes in the wilderness. The invention of steam paddle-boats (Hiawatha's chunking " canoes of thunder ") made progress easier and brought supplies more quickly from the east. But the westward movement soon passed beyond the help of steamboats, for in the west there were few rivers to float them.

The prairies now, like the South African veld, were worn with the wheels of a great trek. The " covered waggons " from the eastern states lumbered slowly into the Far West. Parching droughts or bitter blizzards met them in an almost treeless country, where there was neither shade nor shelter. Roving Indians watched the trails they followed for chances of massacre and loot. Many of the pioneers perished with all their families. But more won through to found the cattle-ranches of the west or seek their fortunes in the goldfields of California. Then came the railways. The Union Pacific, the first to cross the whole continent, was opened in 1869. Emigrants in greater numbers than ever began to people all the Far West to the Pacific coast.

So the continent was spanned. The Indians were shepherded into " Reservations," and the tide of civilisation flowed over their old hunting-grounds. The Far West soon ceased to be the Wild West: the day of the pioneer was over, and his place was taken by the stock-raiser, the grain-farmer and the mining company.

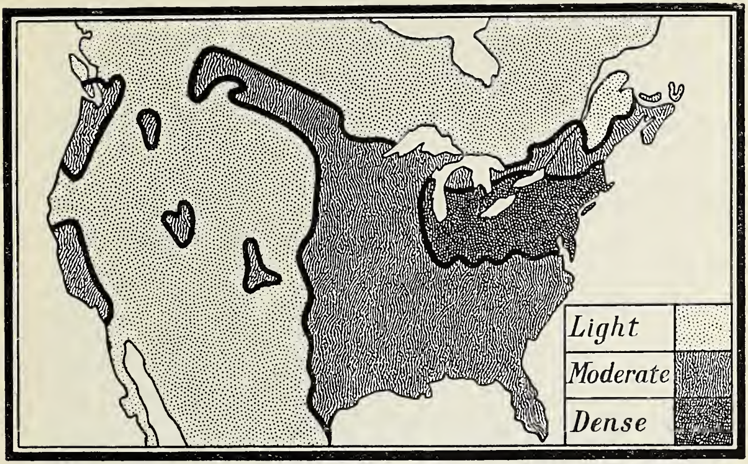


An Engine of the Last Century. The wide funnel-top was designed to keep down the sparks which might start a prairie fire. The cow-catcher was necessary when animals might stray on to the unfenced line, and the lamp was extra large. Notice the bell, usual on American engines.

The earlier pioneers, whose trails had ended east of the Mississippi, had cleared the land with axe and plough to make grain and cattle farms for themselves. Over all the northern half of the United States men worked for themselves or hired free wage-earners to help them.

In the south, another movement kept pace with the one we have just followed. There the climate and the crops seemed to make slave-labour very necessary. The plantations of the south-east could not satisfy the growing demand of Lancashire and Europe for cotton, and the planters spread steadily westward to the Mississippi and beyond it, planting new cotton fields and using more and more slaves to work them.

So the United States came to include two widespread populations with different ideas: the farmers of the North, who flourished on free labour, and the planters of the South,



The Distribution of Population. The eastern half is more closely settled than the western half. Compare this map with those of rainfall and activities on pages 278, 281, and notice how nearly the line between moderate and scanty settlement corresponds with that for 20 inches of rain.

to whom slavery seemed both natural and necessary. The two systems could not continue for ever in the same country.

In Canada, beyond the St. Lawrence Basin, settlement was slower than in the United States. Two serious obstacles hindered it: the barren rocks of the Canadian Shield, and the opposition of the Hudson Bay Company, which had rights over most of the country from the Pacific to Labrador. A fur company does not welcome settlers, for towns and farms frighten away the animals whose skins produce its wealth. So Indians and trappers had that vast area to themselves, except for the lonely trading-posts of the Company.

Even when the Canadian Government obtained control of the Hudson Bay Territories, few settlers entered the western region until the Canadian Pacific Railway was built. Progress in the last fifty years has been rapid. Wherever a branch line has opened up more land, farmers from Europe, Eastern Canada or the United States have eagerly settled on it.

Only in the Far North, where settlements are creeping towards the Arctic Circle, or in the goldfields of British Columbia, can we find today any remnant of the old free "frontier of adventure." But even there motor-cars, aeroplanes and wireless make life very different from what it was in the days of the covered waggon, the stage-coach and the pony-express (see page 266).

But we must not suppose that even yet the population of North America is evenly spread. Nearness to Europe, the homeland from which the people came, has caused the East, both of Canada and the United States, to fill up first. But two other causes will continue to keep the greater part of the population in the eastern half. Nearly all the coal is found in the east; the rainfall also is greater there. Coal helps manufactures: more rain means bigger crops; and where the food and the factories are, there will the people gather most closely together.

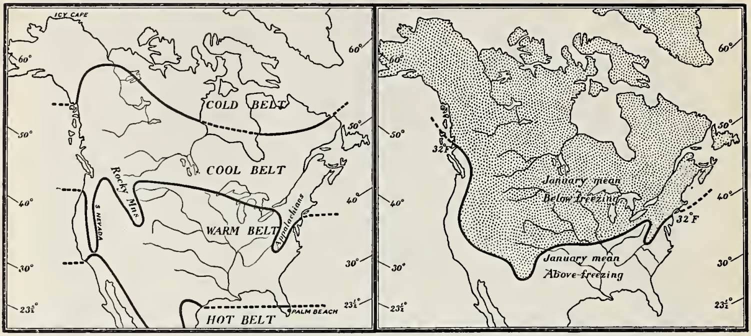
Moose

Lumbering. A deep notch is being cut near the base of this five-hundred-year-old Douglas Fir to guide its fall. When the notch is completed, the tree will be sawn through from the opposite side and will fall across the notch.

CHAPTER 4

NORTH AMERICA: COLD, HEAT AND RAIN

FROM Palm Beach in Florida to Icy Cape in Alaska is more than 4,000 miles. The names tell their own story. Between the two we shall find the whole range of climates that lie between the Tropics and the Arctic Regions.


ICY CAPE
60°
50°
40°
30°
23½°
COLD BELT
COOL BELT
Rocky Mts.
S NEVADA
WARM BELT
Appalachians
HOT BELT
PALM BEACH
32°F
January mean
Below freezing
January mean
Above freezing

Temperature Belts. Most of the United States is in the Warm Belt and summers are hot. Canada and the north-eastern United States are in the Cool Belt, but even here summers can be hot, too. Although summers are hot, winters are very cold even half-way south across the United States, except on the west coast, towards which the winter Westerlies bring mild air from the Pacific.

Most of the United States lies in the Warm Belt; most of Canada in the Cool Belt. But it is not quite so simple as that. The great trough of the Central Lowland allows the summer warmth to extend northwards to the Great Lakes. For the same reason winter snows may sometimes visit New Orleans. In summer the thermometer may rise to 100 degrees in the shade for days together, but the dry air makes such temperatures more bearable than we should find them in England. In the Mississippi Basin the weather may be disturbed by tornadoes. These whirlwinds are as destructive, while they last, as West Indian hurricanes, though their path is much narrower and they die down much sooner.

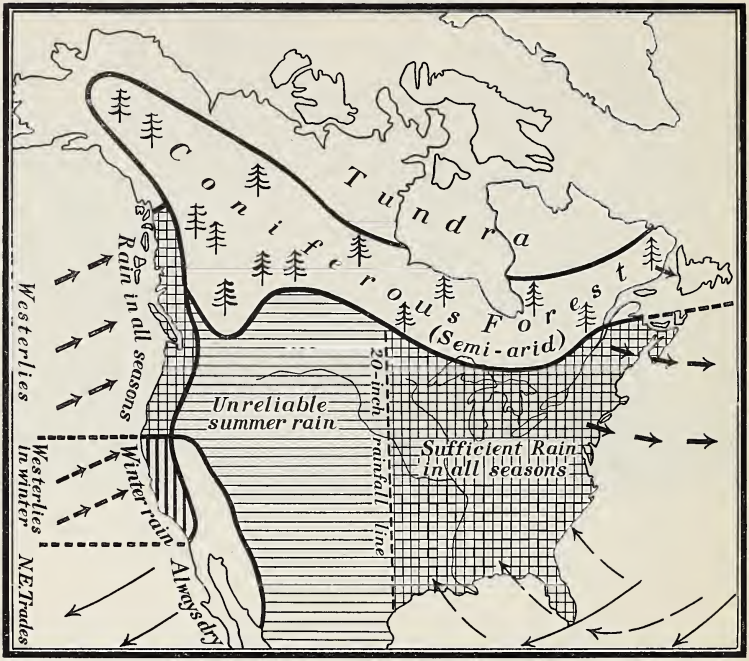
In winter the temperature often falls below zero (32 degrees of frost), but when a blizzard blows it is far worse. The biting wind is full of powdery snow, which hides everything more than a yard or two away. Few who are caught by a blizzard far from shelter may hope to escape alive.

Beaver Felling a Tree.

Lumbering. Large trunks are sawn up into lengths and hauled to a river bank by caterpillar tractor, as here, or by narrow-gauge railway. Smaller timber may be hauled over the snow in winter by teams of horses.

Since in the north the temperature is the most important influence, and in the warmer south the rainfall, we may divide North America into four sections: a Cold North, a Cool Region of forest, and south of this a Dry West, and a Rainy East.

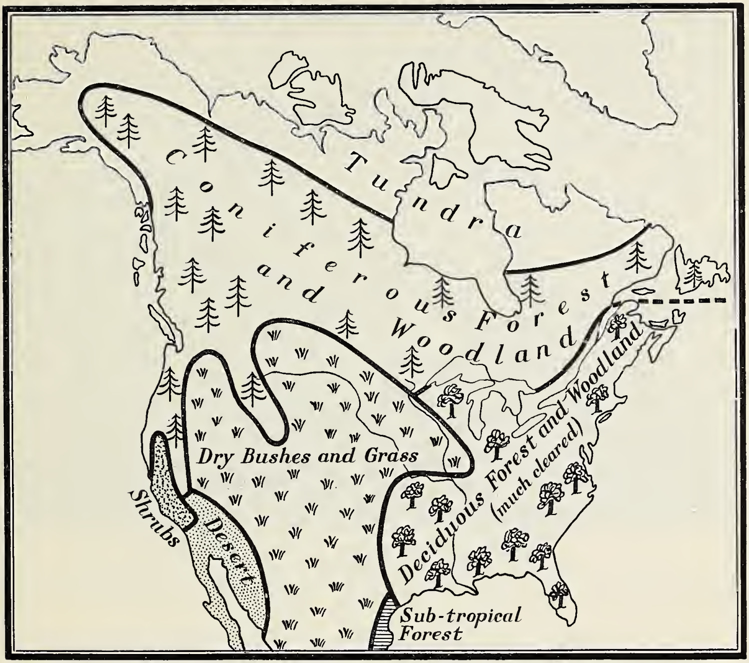
The Cold North is not wholly desolate. Hardy people find pleasure in its biting air and brilliant colouring and the wonders of its Northern Lights flashing in the long winter darkness. In the short summer the ground thaws only for a foot or so, but that is enough to clothe it with a green mantle of moss and grasses. Scattered clumps of flowering plants and low berry-bearing bushes make the most of the long daylight and such heat as is left from the melting of the snow and ice. On pools of the melting ice water wild fowl abound—and countless


Tundra
Coniferous Forest
(Semi-arid)
Rain in all seasons
Westerlies
Unreliable summer rain
20-inch rainfall line
Sufficient Rain in all seasons
Westerlies in winter
Winter rain
N.E. Trades
Always dry

Rainfall. Notice that, south of the forest belt, the eastern half has, as a rule, plenty of rain in all seasons, brought by winds from the Atlantic and from the Gulf of Mexico. Most of the western half has scanty rain, and even that is very uncertain. The west coast has more rain—along the north in all seasons from the Westerlies; in California in winter, when these winds move to their southernmost limit, as shown by thick broken arrows. Where the Trade Winds (thin arrows) blow from the land, no rain can fall.

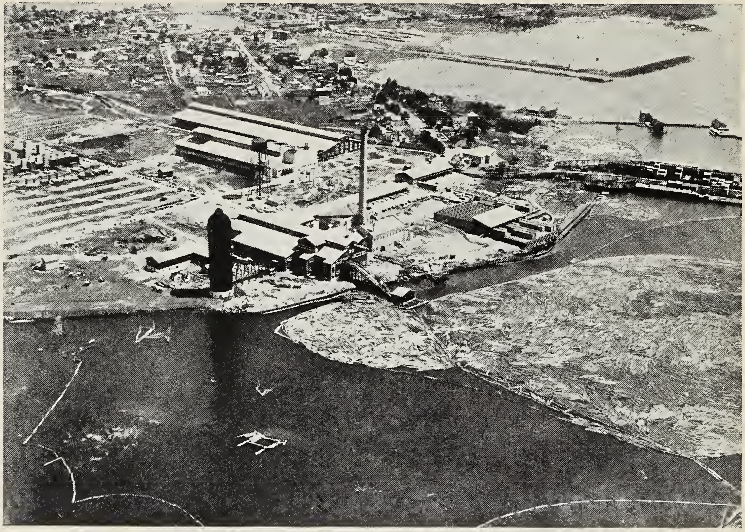
mosquitoes thirsting for blood ! This is the Tundra, the frozen " barrens " of the North, the hunting-grounds of the Eskimos.

The forest which stretches across Canada south of the Tundra consists mainly of soft-wood trees like pines and firs.


Tundra
Coniferous Forest and Woodland
Dry Bushes and Grass
Shrubs
Desert
Deciduous Forest and Woodland (much cleared)
Sub-tropical Forest

Natural Vegetation. Compare this map with the rainfall map and note that on the whole (*a*) the rainy eastern half is marked as covered with broad-leaved forest and woodland, though much of this has been cleared for farms, (*b*) most of the drier western half is covered with dry bushes and short grass, which give place to desert in the hot rainless south-west. The west coast has forests in the north and shrubs in the winter-rain belt of California.

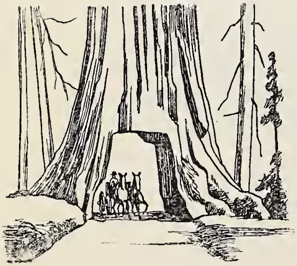
In earlier days it was visited only by Indians and white trappers in search of fur-bearing animals, beaver and musquash, sable and silver-fox. Then came the lumbermen, and now many rivers of the east and west are filled each spring with the logs that have been dragged down over the winter snow. All summer



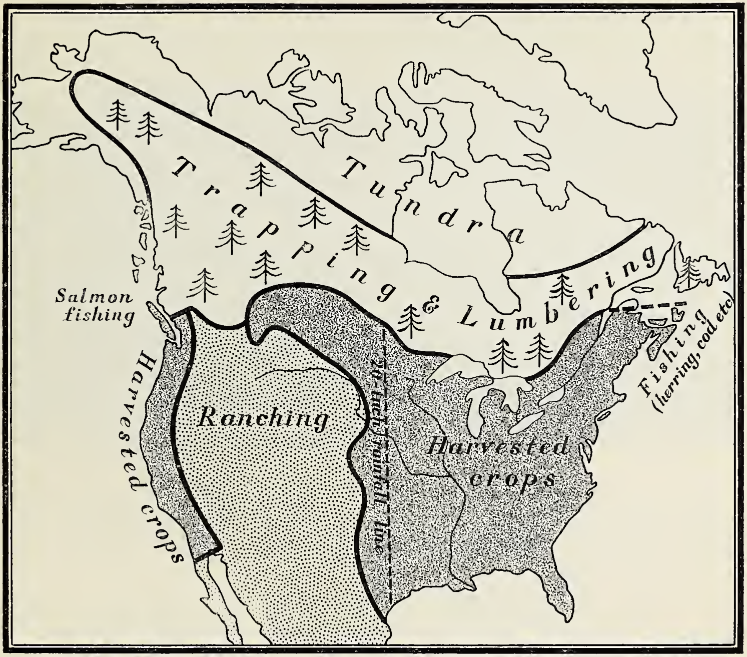
Lumbering. At the mill the logs are gathered in a boom and hauled up the sloping platform seen in the picture on to the circular saws, which rip the trunks from end to end.

the mills at the lower falls are busy cutting them into planks or crushing them to pulp for the makers of paper and artificial silk. Minerals, too, of many kinds are found on the Canadian Shield. Sudbury, north of Lake Huron, produces most of the world's nickel, and north of this again there are a number of gold-mining settlements.

Forests like those of Canada extend south into the United States among the mountains of the east and west. On the Pacific Coast there are forests of trees over 300 feet high, the famous "Big Trees" of California.



Californian "Big Tree."


Tundra
Trapping & Lumbering
Salmon fishing
Harvested crops
Ranching
20-inch rainfall line
Harvested crops
Fishing (herring, cod etc.)

The Use of Land and Sea. Compare this with the rainfall and vegetation maps. The rainy eastern half is the land of the ploughman and harvested crops; the drier western half is the land of the stock farmer, of cattle, sheep and horses. Along the west coast rain is again sufficient for the ploughman, but California requires summer irrigation. There are important fisheries on both east and west coasts.

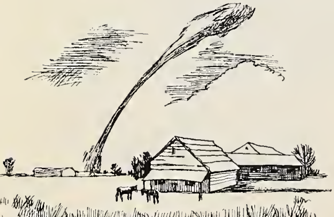
Since it possesses forests, the Dry West cannot all be dry. The Pacific Coast is, in fact, well supplied with water. In British Columbia rain falls at all seasons as in Britain, but the Westerlies only water California in winter, and the rainfall ceases on the west before Mexico is reached. In the north, wheat, fruit, and dairy farms share the cleared bottom-lands. The rivers

Irrigation. The western third of the United States is almost rainless, and it can only be made productive by irrigation. But the supply of water is only enough to irrigate about one-fifth of the area. Thirty years ago this valley was as dry and barren as the hills beyond it. Irrigation has changed it into productive fields and orchards with homes for thousands of farmers and villagers.

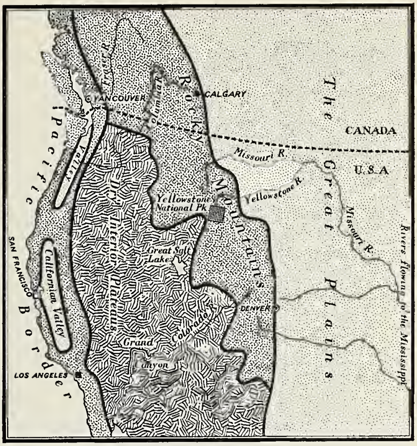
teem with salmon, which are tinned for the British and other markets.

But the most favoured region is the Californian Valley. It lies behind the coast range and gets little direct rain, but the rivers from the snow-covered Sierra Nevada are used to irrigate the fertile soil. In the long summer sunshine many fruits come to perfection: oranges, grapes, peaches, apricots, figs and the finest pears. These are sent, fresh, sun-dried and tinned, to the cities of the east and overseas.

Into this valley come all the overland railways of the United States. They carry its produce eastward, or seaward to San Francisco, the great Pacific port. But Los Angeles, south of the



Tornado.

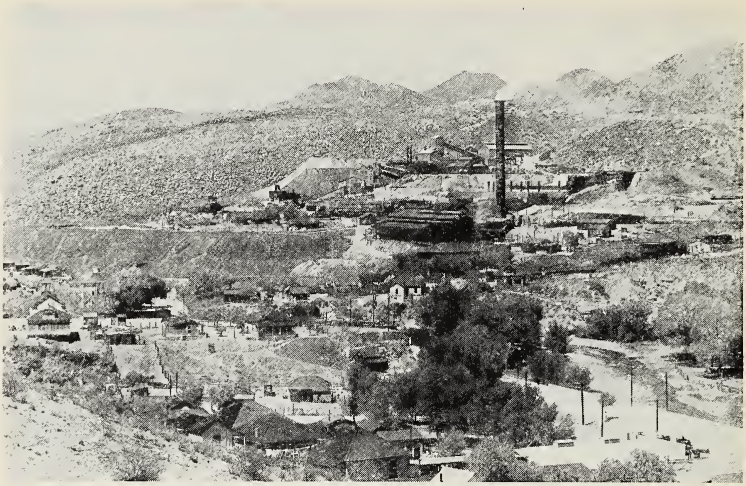

Fraser R.
Columbia R.
VANCOUVER
CALGARY
Rocky Mountains
The Great Plains
CANADA
U.S.A
Missouri R.
Yellowstone R.
Missouri R.
Pacific Border
Valley
Yellowstone National Pk.
Dry Interior Plateaus
Great Salt Lake
SAN FRANCISCO
Californian Valley
DENVER
Colorado R.
Grand Canyon
LOS ANGELES
Rivers flowing to the Mississippi

The Western Coast, Plateaus and Plains. The great divisions from west to east are (*a*) the coast lands and valleys of the Pacific Border with three large cities marked, (*b*) the interior plateaus and mountains, crossed by three large rivers (including the Grand Canyon of the Colorado), together with the Yellowstone National Park, (*c*) the Great Plains, falling towards the Mississippi, with their rivers flowing in the same direction. Two large towns are marked, markets between the farming people of the mountains and the stock farmers of the Plains. The broken line marks the boundary between Canada and the United States.

Valley, is now the largest town, with a population of a million and a half. Behind it lies an important oil-field, and its suburb, Hollywood, is the largest film-producer in the world. Hollywood made its name because of its brilliant air and climate, which specially favoured out-door photography. But even at Hollywood films are now mostly " shot " indoors.

Further inland, the mountain region broadens southward from British Columbia through an area of fertile volcanic soils to a semi-desert of thin grass and low bushes. It ends in a complete desert of cactus, rock and sand. The volcanic region includes the famous Yellowstone Park with its spouting geysers and hot springs, its wonderful scenery and abundant animal life. The semi-desert country carries a scanty stock of sheep and cattle. Careful irrigation brings water to a few oases, such as that of Salt Lake City. Miners are still active in the mountains of both British Columbia and the United States, but copper and lead are more plentiful now than gold and silver.

Denver, on the mountain edge of the Great Plains in the

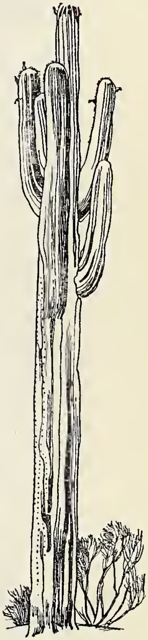


A Copper Mine. The scene is in the dry southern Rocky Mountains—in the state of Arizona; the country is desolate and barren. The diggings are below ground and the ore is raised by lifts called " hoists." The engine house, shaft-head winding gear, rubbish dumps and homes of the workers are all seen in the picture.

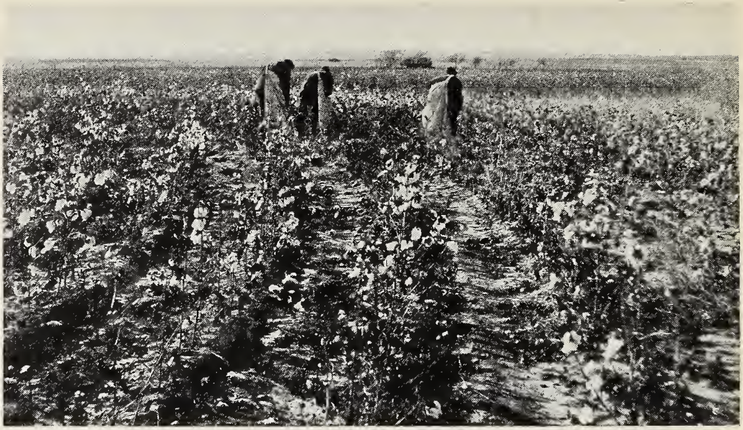
United States, began as a mining town, but now boasts the largest stockyards of the West. It is the chief market for the miners and the cattlemen, whose districts meet in these foothills of the Rockies. Calgary is in a similar position in Canada and serves the same purpose further north.

From the Rocky Mountains the Great Plains slope gently to the east. They grow a short, dry grass, which fed in earlier days the ranging herds of bison. But the cattle which have taken their place must now feed in fenced pastures. The big, open ranches are no more, and the cattlemen must sow richer grasses, like alfalfa, to feed their stock on smaller holdings. The cow-boy and his " broncho " have almost disappeared.

Little of the Atlantic rains which water the East reaches the western half of the continent. In the centre and the west, the destruction of the grass cover of the prairies by ploughing or overgrazing may be fatal in the droughts, which are sometimes as severe as those in Australia. In this " dust-bowl " the naked soil is liable to be swept away in dust-storms. Wide landscapes may thus be reduced to desolation, with ruined crops and smothered farmsteads.



" Candlestick " Cactus of the Desert.



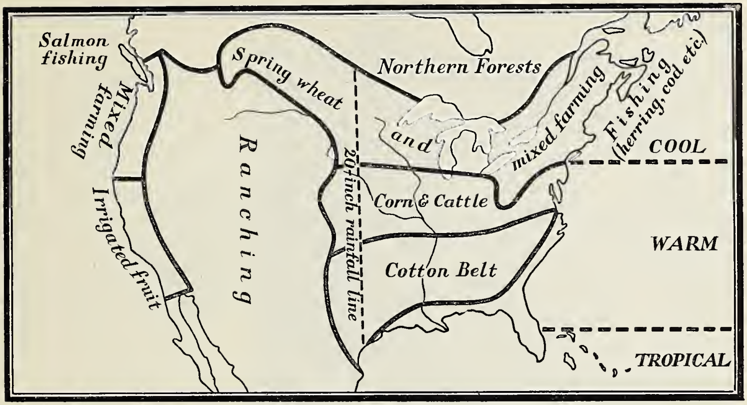
Contour Planting in a Cotton Field. Negroes, sacks on shoulders, are busy picking the bursting pods. Note that the rows are curved. The fall of the ground is from left to right; the soil has been ploughed and the cotton planted round, and not up and down, the slope, so that heavy rain-storms shall not wash away the soil. The plants are on slight ridges to prevent the water standing about the roots.

CHAPTER 5

NORTH AMERICA: COTTON, CORN AND CATTLE

EAST of the one-hundredth meridian, which divides North America into two almost equal halves, we reach the wetter side of the United States. Here the rainfall is evenly spread. Temperature makes the important differences in the chief occupations of the people as we pass from the almost tropical South to the cooler North.

When the land-owners of the South bought negro slaves from West Africa, it was not considered a wrong thing to do. It seemed the simplest way of finding people to work for them under a hot sun. They grew tobacco and cotton to provide money to buy English manufactured goods.

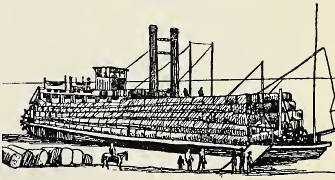

Salmon fishing
Mixed farming
Irrigated fruit
Ranching
Spring wheat
20-inch rainfall line
Northern Forests
and
mixed farming
Fishing (herring, cod etc.)
COOL
Corn & Cattle
Cotton Belt
WARM
TROPICAL

Divisions in the Use of the Land. Note that east of the 20-inch rainfall line farming produces harvested crops. The chief products change as one goes northwards. In Canada, where less moisture is lost by evaporation, the spring-wheat belt extends well to the west of the line.

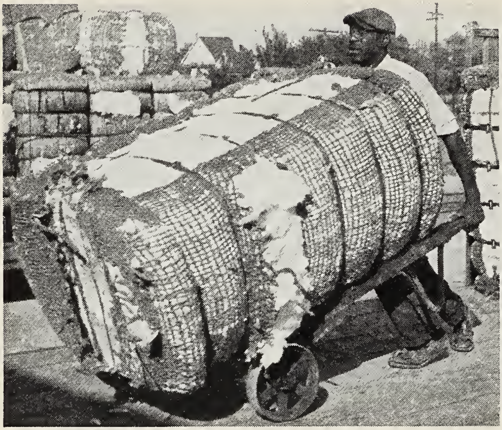
But the people of the North hated slavery, and in 1863, after the Civil War, all the negroes were set free. Full equality with the white population, however, has been difficult to get, even though they are supposed to have equal rights. The feeling between the races is often very strong, particularly where, as in some districts of the South, there are more negroes than whites.

Though there are many negroes elsewhere, they find employment chiefly in the Cotton Belt. This covers most of the Southern States, and extends well to the west of the Mississippi. New Orleans, 100 miles up the river among the marshes and mosquitoes of the delta, is the chief cotton-town. This is the greatest cotton-growing region in the world, though the plant is not a native of North America.

Cotton cannot stand frost during the growing and seeding season, which lasts from April to October. It therefore requires



Mississippi Cotton Boat.

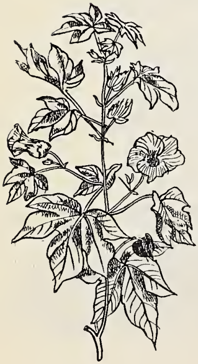


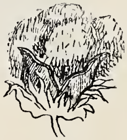
Transport of Cotton. When the cotton has been ginned, it is packed into flat-sided bales of 500 pounds and tied with sacking, probably of jute from Calcutta. The flat sides make for easy storage on lorry, rail-truck or ship, as in the marginal sketch of a Mississippi steamer loaded with cotton bales (p. 287).

a warm climate. The valuable part of the plant is the white fluff, or lint, attached to the seeds. The fluff serves, under natural conditions, to float them on the wind, like thistledown. But the hairs of the lint are tough and twisted, and can therefore be spun into strong thread. The crop must be picked carefully by hand, and much depends on the skill and speed of the negroes, men, women and children, who gather the harvest.

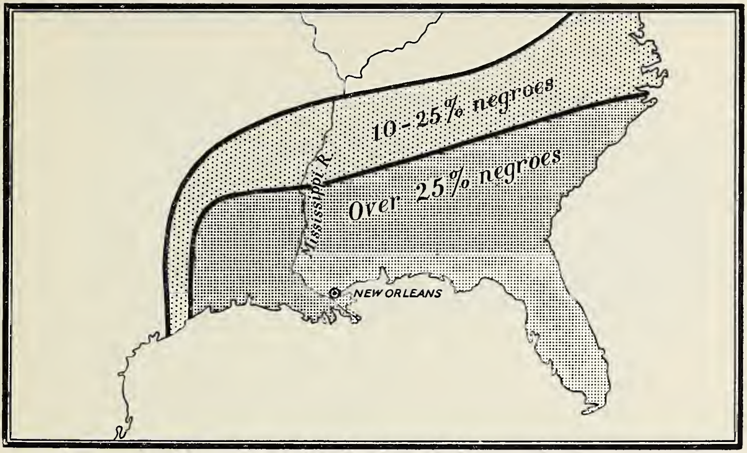
Some of the cotton is grown by planters on large estates, but much is produced by small farmers, both white and black. Some of these pay rent for their land, but many give the owner a share of the crop instead, and are known as "share-croppers." In either case they are generally very poor, and in the Cotton Belt there is much complaint of dirt and disease, of tumble-down "shacks" instead of decent houses, of ill-kept land and "soil erosion."

We saw something of this, under drought conditions, in the "dust-bowl." In the south it is rain that brings disaster, for heavy storms wash the





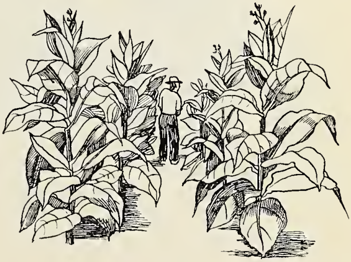
Cotton Plant and Boll.



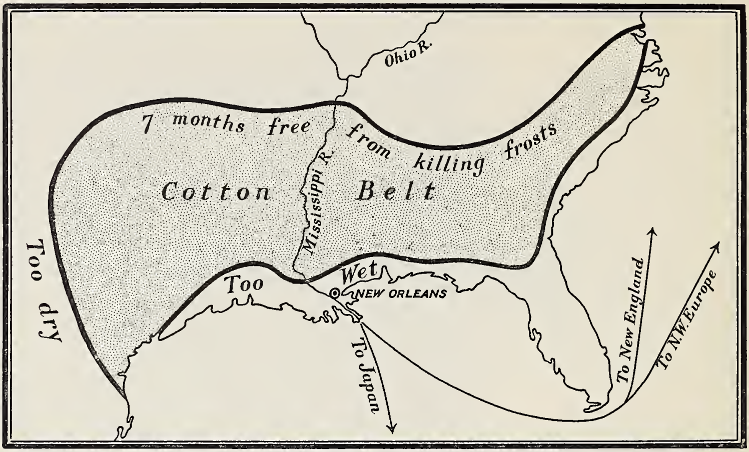
Negroes in the United States. In one or two of the Southern states they number more than half the population both in towns and in villages. In the North there are large groups of negroes in cities like New York and Chicago, but not many in the countryside.

soil off the hill slopes where the land has been recklessly cleared of its natural cover of trees and grass. The fertile cotton and cornfields may be flooded by the muddy torrents and ruined in their turn. Efforts are now being made to lessen the evil by planting trees, building banks and walls to stop the "run-off" and by "contour-ploughing" (see picture, page 286).

The cotton crop is largely exported to Lancashire and other foreign markets, or to the mills of the north-eastern states. But wages are lower in the South, and more and more cotton-mills are being built there to profit by the lower cost of manufacture. This also saves the cost of carrying the



Tobacco Plants.


Ohio R.
7 months free from killing frosts
Cotton Belt
Mississippi R.
Too dry
Too Wet
NEW ORLEANS
To Japan
To New England
To N.W. Europe

The Cotton Belt. Cotton is the chief crop in the shaded area. About half the ploughed land is under cotton. To the west the climate is too dry, and irrigation is necessary if cotton is grown. Along the coast it is too wet. To the north the warm season is not long enough. Much of the cotton is exported through New Orleans and other ports; the arrows show three of the chief markets to which it goes.

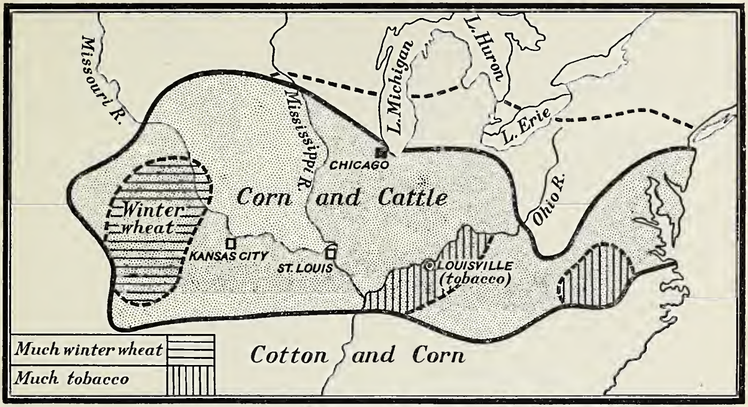
raw cotton to the Northern mills and bringing the cloth back again for sale in the South.

Before the seed-cotton is ready for the draper's counter in the form of cloth, it is ginned, spun, woven and dyed.

Ginning removes the seed from the lint. This is done on the plantations by machines which tear the lint away with as little harm to its fibres as possible. The cotton is then sent in bales to the factory.

There the cotton is cleaned and combed till it is reduced to a soft untwisted fibre arranged in loose lines. These are twisted into thread or yarn. In this form it can be used as sewing-cotton or woven into cloth.

Finally the cloth is dyed, if the threads were not dyed

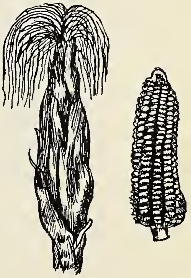

Missouri R.
Mississippi R.
L. Michigan
L. Huron
L. Erie
Ohio R.
CHICAGO
Corn and Cattle
Winter wheat
KANSAS CITY
ST. LOUIS
LOUISVILLE (tobacco)
Much winter wheat
Much tobacco
Cotton and Corn

The Corn Belt. About half the land in the shaded area is under corn at any one time in rotation with other crops like wheat and clovers. Three important cities which tin the " bully " beef, lard and other products, are marked. Wheat is the chief crop in the drier west and tobacco in two regions of the east. The eastern of the two tobacco regions is in Virginia, so famous for tobacco and cigarettes. But now Kentucky, the western region, produces more and has the greatest tobacco-manufacturing city, Louisville. Corn will grow but not ripen as far north as the broken line through the Great Lakes.

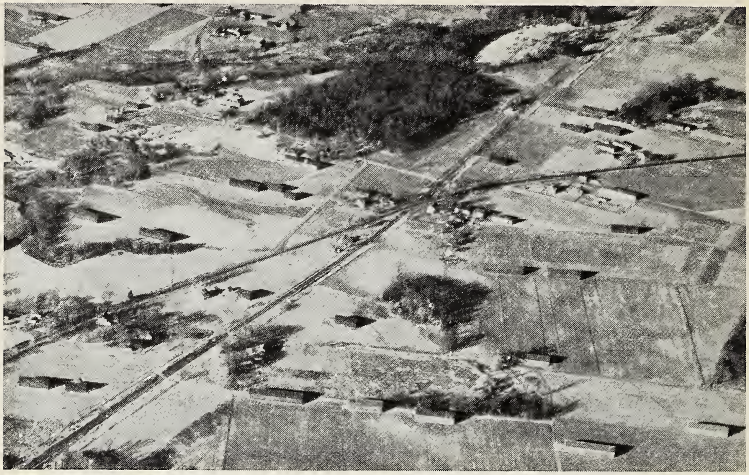
before, or bleached white, according to the use for which it is intended.

North of the Cotton Belt comes the Maize, or Corn Belt, as the Americans call it, with patches of tobacco-growing, for the famous Virginia leaf is now cultivated in other states as well. The greater part of the world's supply of tobacco comes from America, whose native inhabitants were the first to smoke it.

The Corn Belt covers the Mississippi Basin northwards to the shores of Lakes Michigan and Erie. Like the tobacco plant, it was first grown by the Indians, but its chief use now is for fattening cattle



Maize and " Corn Cob."



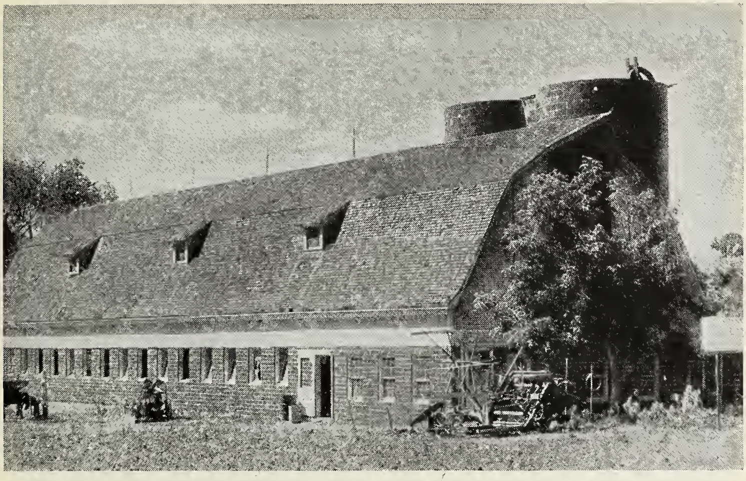
Tobacco Farms. The long barns, in which the leaves are hung up to dry, are as characteristic of tobacco country as the cattle barns and hog-fences of the animal-rearing parts of the Corn Belt.

and pigs. The low "hog-barns" and the wide-meshed wire fences to keep the pigs in their fields are seen all over the Corn Belt.

This is the most prosperous farming region of the East—very different from the Cotton Belt! Many farmers own their own farms, which have good houses and well-kept outbuildings. They can afford up-to-date machinery and silos, which preserve the feeding value of the green crops.

The farmers of the Corn Belt need not, like the cotton-growers, find markets at a distance. The local pigs and cattle eat the corn, and the meat-packing firms of neighbouring towns, Chicago, St. Louis or Kansas City, buy the stock when it is fattened.

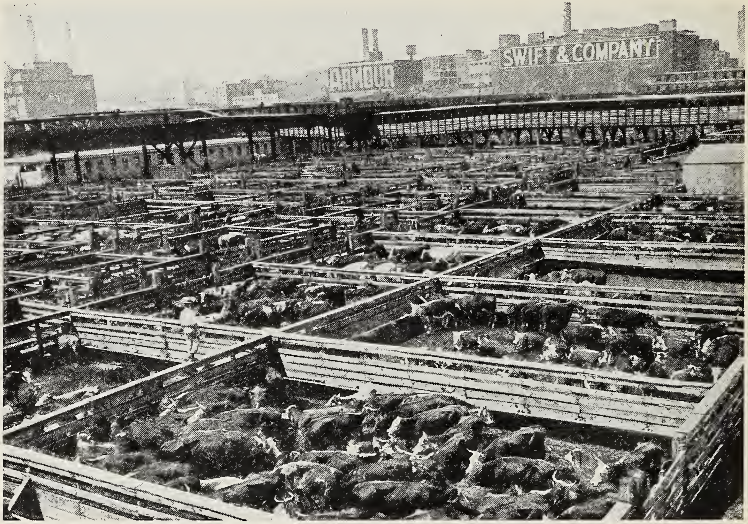
The position of Chicago makes it the key-town for the



A Farm in the Corn Belt. The cow-barn is solid, well-lighted and well kept. Inside, it is equipped with electricity and hot and cold water. Outside, the round towers of silos are visible; behind and in front is up-to-date machinery. At the bottom right-hand corner wide-meshed wire hog-fencing can be seen.

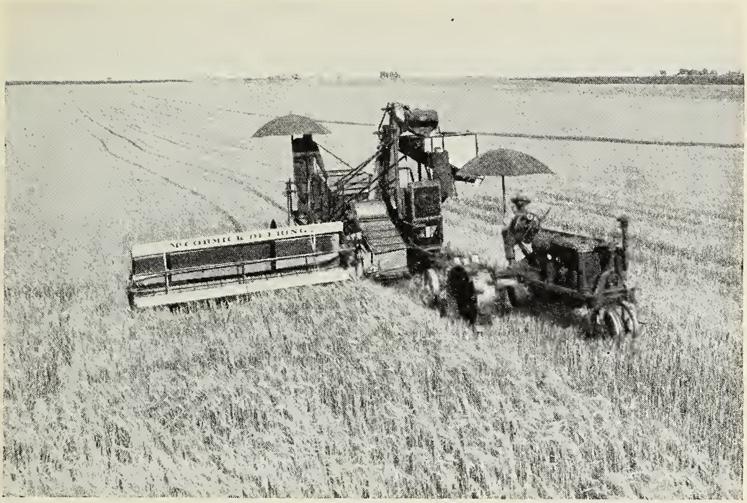
traffic of all the Northern United States. All the railways must pass round Lake Michigan, and the lake itself is an important waterway. But the city is also joined by rail and canal to the rivers of the Mississippi valley. With the help of the coal found near by it has become a great centre of the steel industry.

St. Louis covers the west bank of the Mississippi for 19 miles, which shows how closely its history is linked with the river. But its modern importance is largely due to the railways from north to south and east to west which meet at this point. Chicago is said to use every part of a pig but its squeal. St. Louis is also not content just to sell the meat of the cattle it slaughters.



Chicago Stock-yards cover 500 acres, the largest livestock market in the world. They can hold 25,000 cattle, 300,000 hogs and 50,000 sheep. The smell is indescribable. Two-thirds of the cattle and hogs are sent out as canned meat, from the slaughter-houses and factories seen in the background.

From their hides it makes leather, and it has the largest boot and shoe trade in the United States.



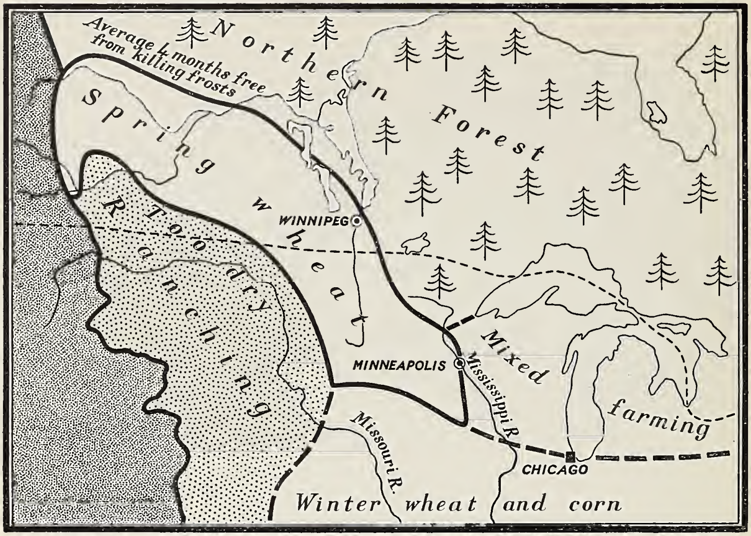
The Combine Harvester here shown is of medium size with a twelve-foot cut. The machine both cuts and threshes, pouring the grain into the bin on the right. Note the huge field and the sun-shades for the crew.

CHAPTER 6

NORTH AMERICA: WHEAT AND MIXED FARMING

WHEN we speak of Belts devoted to special crops, it does not, of course, mean that nothing else is grown there. We have pointed out that a great deal of maize (and other things also) is harvested in the Cotton Belt. So it should be explained that the wheat area of North America begins in the Corn Belt, though that name refers only to maize. The winter is cold but not so severe as to cause serious risk to the crop sown in the autumn, and the Corn Belt is therefore the region of " winter " wheat, as it is called, as well.

In the central states of that Belt maize and wheat are grown in almost equal quantities, but on the drier prairies


Average 4 months free from killing frosts
Northern Forest
Spring wheat
Too dry
Ranching
WINNIPEG
MINNEAPOLIS
Mississippi R.
Mixed farming
Missouri R.
CHICAGO
Winter wheat and corn

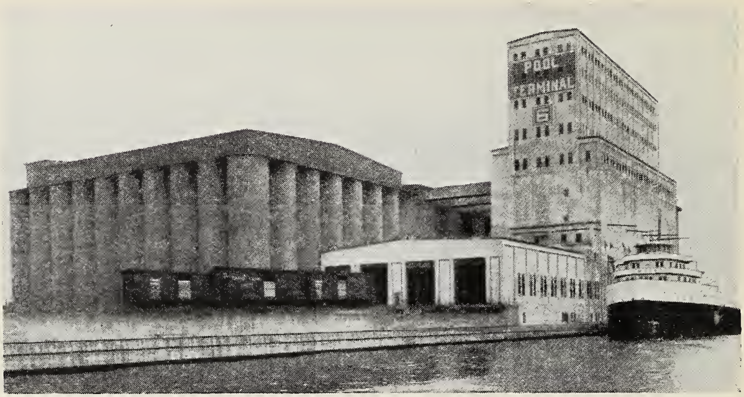
The Spring Wheat Region of the Prairies. Compare this diagram carefully with the atlas and make out on the map what part is covered by each of the five regions named. The dark shading to the west is the Rocky Mountains; the line of dashes is the boundary between Canada and the United States. Notice that the Spring Wheat Region stretches from the Upper Mississippi north-westwards across the South and North Saskatchewan Rivers.

west of the Mississippi winter wheat is the main crop (map, p. 291). The stock-yards and meat-factories of Kansas City, on the Missouri, are second only to Chicago's. This city is the western capital of the Corn Belt and shares with St. Louis and Chicago the chief wheat trade of the Belt. By dry-farming methods wheat-growing is spreading into the cattle country of the Great Plains (the same thing is happening in Australia and Argentina), and Kansas City must become still more important. It has long been called "the Gateway of the South-West." If you look at a railway map, you will see that it deserves the title.

Grain Elevators on the Canadian Prairies. The six " elevators " or " warehouses " are landmarks for miles on the level prairies. They line the railway track at a country station. Beside them is a train of " box-cars " which will carry the wheat " in bulk " to the terminal elevators at the ports.

North of the Corn Belt wheat-growing is hampered by severe winters and late springs, but the soil of the northern prairies is deep and fertile. These natural grasslands extend north-westwards between the Rockies and the Great Lakes. They are 800 miles wide. Near Winnipeg they are flat, but further west they rise and fall in rolling downs and hollows, much like the English chalk country.

The rainfall, snow included, is none too plentiful, and trees are rare, except along the rivers. Rain in summer may come in heavy showers or thunder-storms with hail, beating down the growing crops. Under the shadow of the Rockies rain is still more uncertain, and wheat gives way to cattle. Winter comes early and stays late. It is brighter and drier than is usual in England: the powdery snow will not " bind " into snowballs. " Cold waves " often send the temperature down below zero; but a warm wind, called by the Indian name

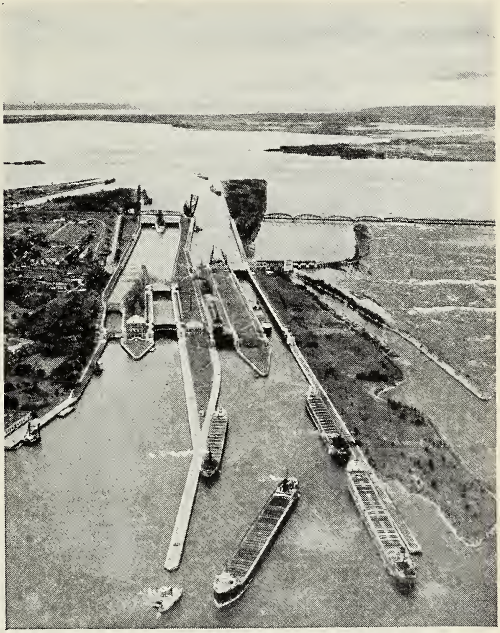


Terminal Elevators at Port Arthur. In the huge " terminal elevators " at the ports the wheat is stored in separate rooms according to quality and, when the time comes, shot into specially constructed vessels. This elevator can store seven and a half million bushels and the vessel in the picture can carry over half a million bushels.

" chinook," may come over the mountains from the Pacific and start a sudden thaw. But the cold and the snow make outdoor work impossible, and those who can afford to do so prefer to leave their farms and spend the winter in towns such as Winnipeg or Vancouver.

Summer comes suddenly with a hot sun as soon as the snow has melted, and the wheat farmer makes the most of it. He works from dawn till dark, though drought, dust, hail and night frosts may ruin his harvest.

Prairie farming is very different from English farming. Wheat is the chief, and often the only, source of profit and everything depends on its successful sale. Fields are large and fences few, and the work is mostly done by machinery. The land is ploughed with tractors drawing often as many as six ploughs. The seed is sown by drills in April, in a soil moistened by the melted snow. By August or September the crop must



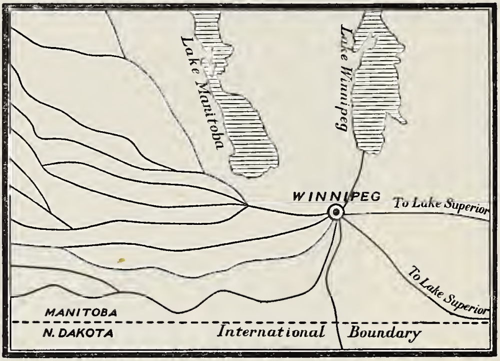
Locks on the Sault St. Marie Canal. Because the level of Lake Superior is 20 feet above that of Lake Huron, the water tumbles in shallow rapids, white with foam, as seen on the right. To avoid them the Sault St. Marie Canal, or, for short, "The Soo," was cut. The many "lake freighters" suggest the busy traffic — in wheat or iron-ore and return cargoes of coal (as described in the next chapter). Each is 600 feet long and will carry over half a million bushels of wheat or 10,000 tons of iron-ore. Engines and funnel are at the stern and the turreted bridge and living quarters forward. The hold is covered with over thirty continuous hatches, so that the whole top can be opened at once, and the cargo shot in or taken out along the whole length. By this means 100,000 bushels of wheat or 10,000 tons of ore can be taken on board in an hour.

be ready for harvesting. The "combine" machine strips the ears over a broad "cut," threshes the grain and delivers it loose or in sacks to a lorry that travels alongside. No one wants the straw, so it is burnt off or ploughed in to manure the next crop.

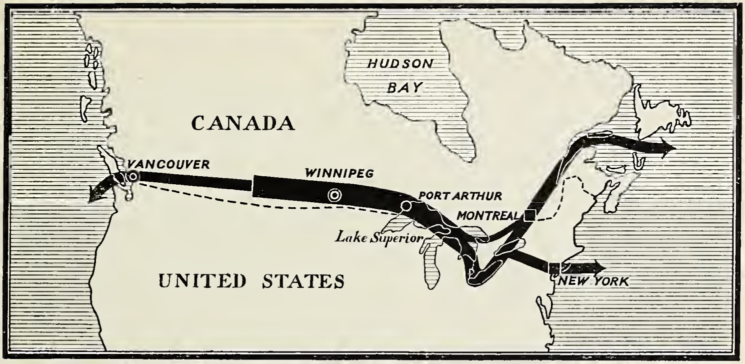
The grain is carried to the rail-side and pumped up into tall barns, called "elevators," which are as marked a feature of the wheat country as the village churches of England. There it is stored until the time comes to pour it down shoots into

60-ton " box-cars " and send it to the flour-mills or the great " terminal elevators " at the nearest port.

Wheat is the chief food of the western world, and farmers want more land on which to grow it. We have seen them ploughing up the drier grasslands of the cattlemen, but the rich soil of the prairies is tempting them in another direction. They are trying to grow wheat, combined with other crops, further and further north, and to get over the difficulties of shorter summers and earlier frosts. By careful selection new kinds of wheat have been obtained which do not need so long a summer season; and farmers are planting these as far north as the southern tributaries of the Mackenzie River, where the longer days to some extent make up for the shortness of the summer. But the scientists hope to breed a wheat that will ripen within 100 days. If they succeed, farmers will be able to grow it still nearer the Arctic Circle.



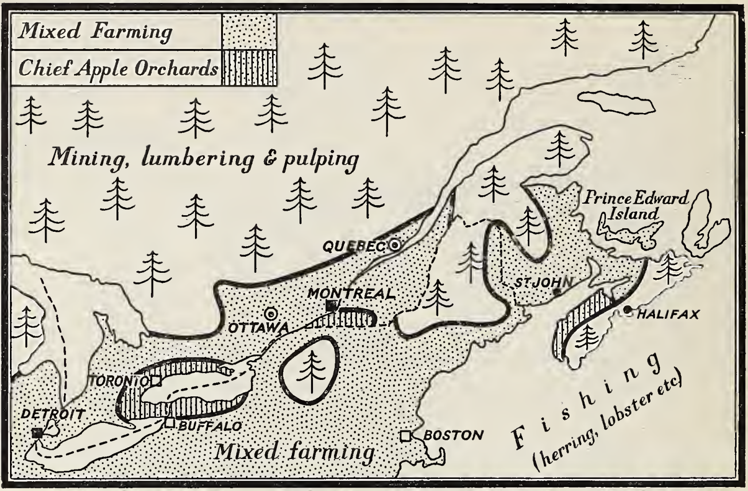
Winnipeg, the Gateway of the West. Compare this map with the atlas. The long lakes Manitoba and Winnipeg, lying north-south, force the many railways which bring the wheat eastwards from the Canadian Prairies to come together near the southern end. The gap between these lakes and the international boundary is only 100 miles wide, and about the middle of this stands Winnipeg.



Wheat Routes to the Coast. Two thirds of Canadian wheat goes eastwards, by rail to Winnipeg and Port Arthur on Lake Superior and then down the Great Lakes. At the lower end of the lakes the grain continues by rail to Montreal in Canada, until the St. Lawrence freezes in December; then it goes mostly through New York in the United States. Now, since the opening of the Panama Canal, one-third of the wheat from the western prairies has been sent westwards to Vancouver.

In the United States, the centres of this " spring wheat " trade are Minneapolis, whose flour-mills we mentioned in Chapter 5, and Chicago. In Canada, Saskatoon is in the middle of the wheat country, and Winnipeg, on its eastern edge, forwards the grain to Port Arthur and the cargo steamers of the Great Lakes. But since the opening of the Panama Canal much of the western wheat has been shipped at the Pacific port of Vancouver.

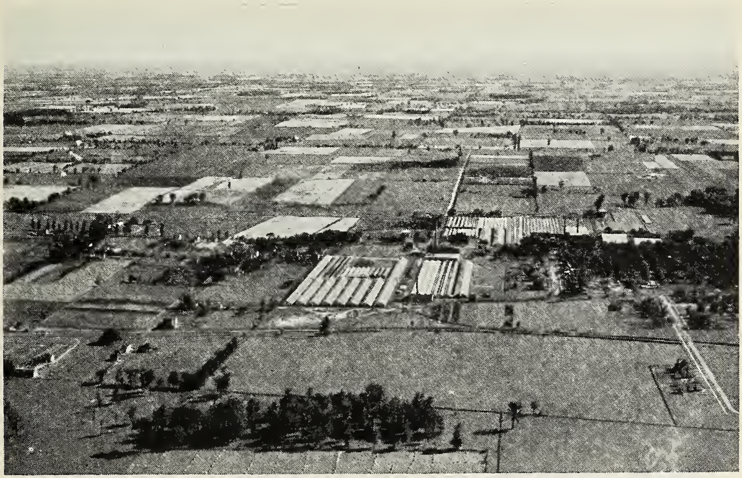
The Upper Mississippi separates the Spring Wheat Belt from the mixed farming region of the older East. This is known as the Hay and Dairying Belt. From the Great Lakes and the St. Lawrence to the Upper Ohio the farmers must use soil that has grown crops for many years. Here, as in England, land is expensive; fields are small, and hand labour more necessary. Deep ploughing, heavy manuring and careful hoeing are required to get the best return from the soil. There is no question


Mixed Farming
Chief Apple Orchards
Mining, lumbering & pulping
QUEBEC
MONTREAL
OTTAWA
TORONTO
DETROIT
BUFFALO
Mixed farming
BOSTON
ST JOHN
HALIFAX
Prince Edward Island
Fishing
(herring, lobster etc)

The Mixed Farming Region of the East. This is shaded. Hay is the chief crop, and dairying one of the chief activities. The line of dashes marks the boundary between Canada and the United States. In Eastern Canada the chief mixed farming regions are three lowlands—in the " Lakes " Peninsula (which is in the latitude of Southern France), along both sides of the St. Lawrence, and in the three Maritime Provinces; each has one district famous for apple orchards. Not far north of the river begins the forest of the Canadian Shield with its quite different activities of mining, lumbering and pulping.

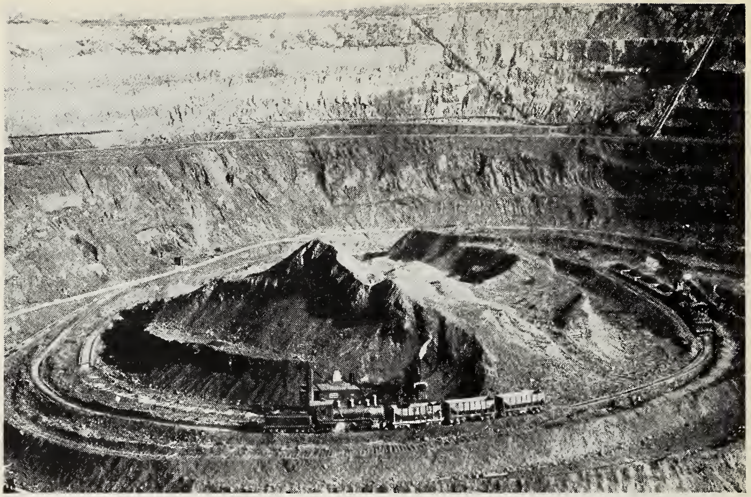
here of growing endless wheat. Roots and clovers must be sown in their turn, for these take different plant-foods from the soil. The cattle which eat them help to manure the land and fit it for another cereal crop. Such methods mean work all the year round. They are becoming necessary on the prairies also as their natural fertility grows less with constant wheat-growing.

This corner of North America is a great industrial and commercial region and its many cities must be fed. The cattle supply them with meat and dairy products, market gardens produce their vegetables and in sheltered places orchards grow



Mixed Farming Country in Ontario. The photograph shows the patchwork pattern due to ploughland with different crops mixed with pastures. In the foreground, grain and grass; in the centre, fruit and flowers under glass. It should be compared with the view over the wheat country of the prairie on page 295.

their fruit. Eastern Canada, which supports a smaller city population than the north-eastern United States, can export both cheese and apples to Europe.

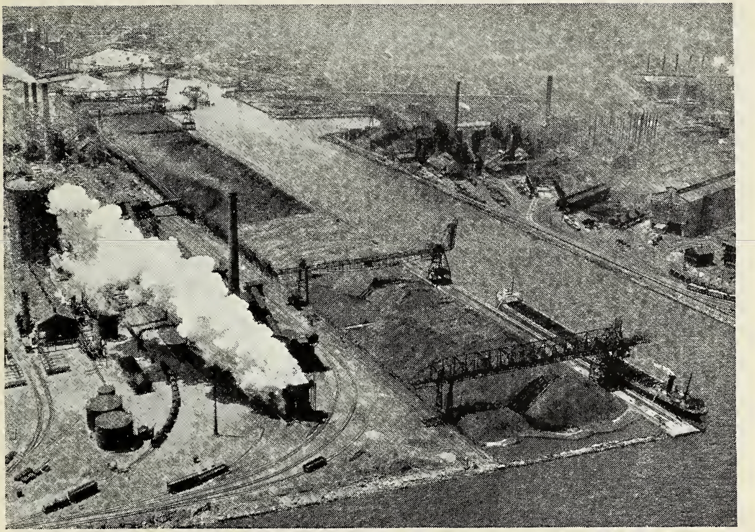


An Open-pit Iron Mine near the Head of Lake Superior. The soft deposits above the ore left by the ancient ice sheet are first removed. The ore is then easily dug out, 10 tons at a scoop, by steam or electric shovels. Since the beds lie horizontally, rails can be laid on the level floor of the open pit; and the trucks run alongside the mechanical shovels for filling. They are then hauled direct to the loading shoots or the lake freighters. Some of the pits are a mile and more in length.

CHAPTER 7

INDUSTRIES AND POPULATION OF THE UNITED STATES

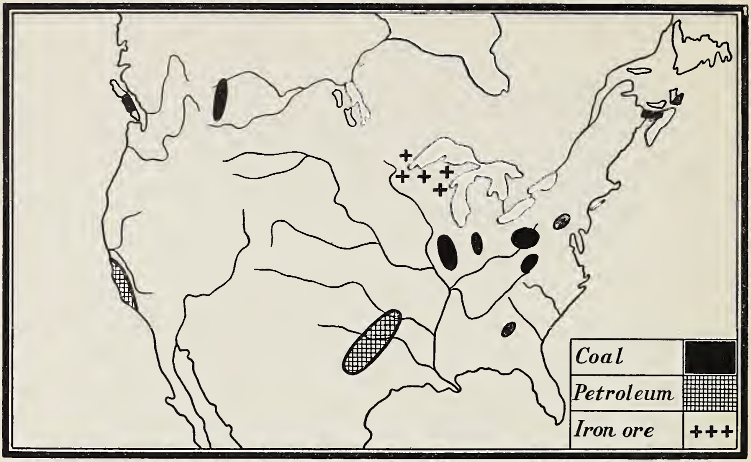
MOST of the industries we have seen so far have been of those simple kinds which prepare natural products for human use—butter-making, meat-freezing, lumbering or flour-milling. Spinning and weaving need more complicated machinery than these, but we are coming now to regions in America (and soon in Europe) where the making of machinery itself, the greatest of all industries, has made most progress.



Blast-furnaces on Lake Michigan near Chicago. Blast-furnaces line the waterway. A lake freighter is unloading ore from Lake Superior. A mechanical shovel, seen over the vessel, scoops the ore from the hold, moves underneath the travelling gantry and dumps it on the pile below; or it can be loaded direct into trucks which run on the rails seen alongside.

The great industries of the United States lie in the north-east between Chicago and New York. Nearly three-quarters of American manufactures are centred there, because of the abundance of coal and iron-ore available. Immense coal-fields, far more easily worked than those of Britain, exist in the Northern Appalachians and Pennsylvania.

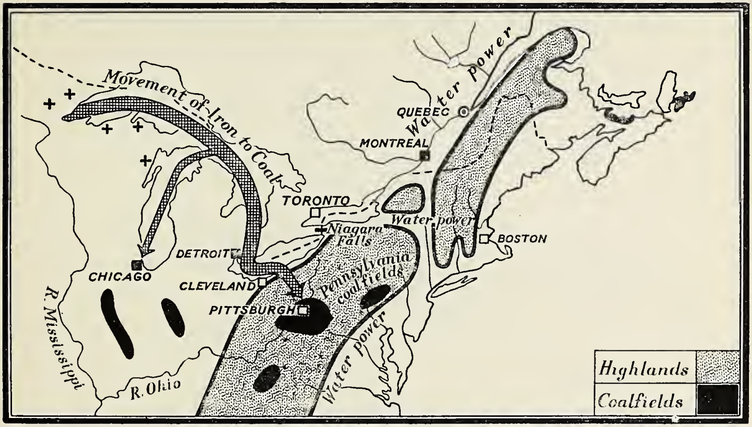
But coal is not the only source of power. Eastern American rivers have many waterfalls to turn the wheels of textile mills and electric power stations. Oil is also used to drive machinery, but the Appalachian oil-fields are now surpassed by those of



The Distribution of some Important Minerals in the United States. Coal is widely spread, but the largest fields of good coal are the three marked in the Northern Appalachians, especially in Pennsylvania. Compare the figure on page 307. Iron-ore comes chiefly from the head of Lake Superior. The most important petroleum fields are now in the south-west, partly in Texas, and in California south of San Francisco. The oil passes by pipe lines to the coast or overland for long distances—*e.g.*, from Texas to the north-eastern states.

the south-western states. The United States is the greatest producer of petroleum in the world.

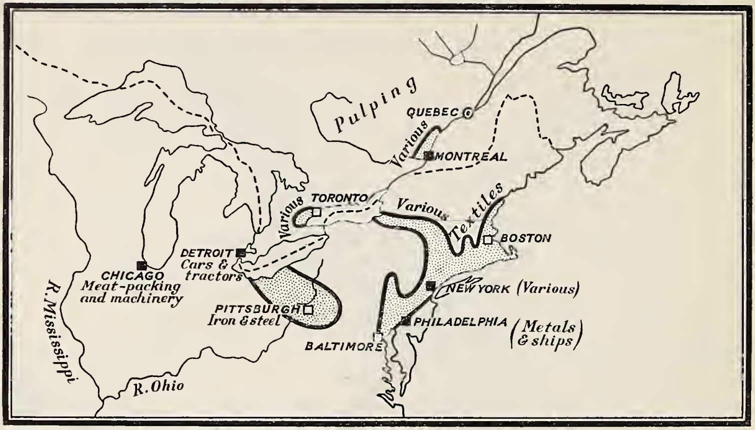
These magnificent supplies of power would be of little use if there was no metal in America. But, in fact, about half of the world's supply of iron, copper, lead and zinc comes from the United States. It was because iron-ore was found near the coal-fields of Pennsylvania that the steel industries of Pittsburgh and other towns first started. Nowadays most of it comes from the west end of Lake Superior, a thousand miles away. But the ore is easily scooped by giant mechanical shovels from open pits, and water-transport by way of the Great Lakes is cheap, so Pennsylvania is still the largest steel producer. Lake-side towns,


Movement of Iron to Coal
Water power
QUEBEC
MONTREAL
TORONTO
Water power
BOSTON
Niagara Falls
DETROIT
CHICAGO
CLEVELAND
PITTSBURGH
Pennsylvania coalfields
Water power
R. Mississippi
R. Ohio
Highlands
Coalfields

Coal, Water-power and Iron-ore. The coal is used in the iron, steel, and other industries of the north-east; it is also sent westwards by the Great Lakes and eastwards to the Atlantic ports. The iron-ore moves to the lakeside cities and to Pittsburg. The falls and rapids of rivers, helped by coal, provide power for textile and many other industries between the Atlantic and the Great Lakes and along the eastern side of the Appalachians.

however, can get the ore more cheaply still. Chicago includes machine-making among her many businesses; Detroit is the birth-place of most American motor-cars and tractors; Cleveland and Buffalo have large engineering works.

" Cast iron " requires great heat to produce it. The ore must be first " smelted " in blast-furnaces, in which a temperature fifteen times that of boiling water is kept up by a blast of hot air. In the melting, most of the impurities float off, and the liquid metal is cast in blocks called " pig-iron." This " cast-iron " is very hard, but also very brittle. It can be re-heated and hammered into " wrought iron," which is certainly tougher, but not hard enough for tools or machinery. Steel is the form of iron in which hardness and toughness are most carefully balanced, but at first it was difficult and

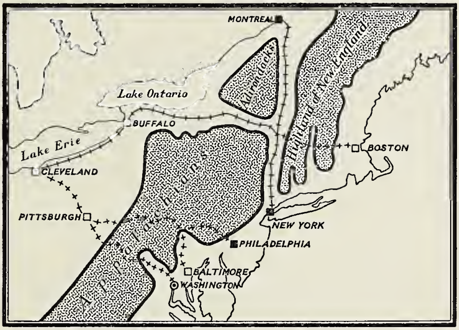

Pulping
QUEBEC
Various
MONTREAL
TORONTO
Various
Various
Textiles
BOSTON
DETROIT
Cars & tractors
CHICAGO
Meat-packing and machinery
R. Mississippi
PITTSBURGH
Iron & steel
NEW YORK (Various)
PHILADELPHIA
(Metals & ships)
BALTIMORE
R. Ohio

The Industries of the North-Eastern United States. The coal, and the river-falls shown on the preceding map, supply the power for the industrial regions marked here. Like most big cities, New York (marked "various") has manufactures of many kinds, especially the goods needed by the people of the city itself—for instance, foods, furniture and clothing.

expensive to make. Tools, rails, girders, bridges, ships and every sort of machinery can now be made of finer steel and at a lower cost than anybody dreamed of a few generations ago, and the United States is one of the foremost producers.

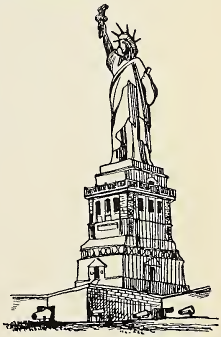
So large a country as the United States can find its chief markets at home; nevertheless there are raw products and manufactured goods for export abroad as well. In the supply of cotton, tobacco, wheat and oil and of canned meats, fruit and vegetables the United States has no equal. American agricultural machinery and motor-cars, carpet-sweepers, typewriters and other labour-saving inventions are found all over the world.

Of the eastern ports the chief are Boston, New York, Philadelphia and Baltimore, but none of the rest has such easy rail connection with the Great Lakes, Canada and the " Middle West " as the Hudson-Mohawk valley gives to New York. The route is lined with industrial towns, and the mouth of the Hudson behind Long Island makes a fine sheltered harbour. But the peninsula on which New York has grown is narrow and can only house its business men by towering into " sky-scrapers." If we count the overflow of population to the other shores of the Harbour, " Greater " New York is larger even than " Greater " London.

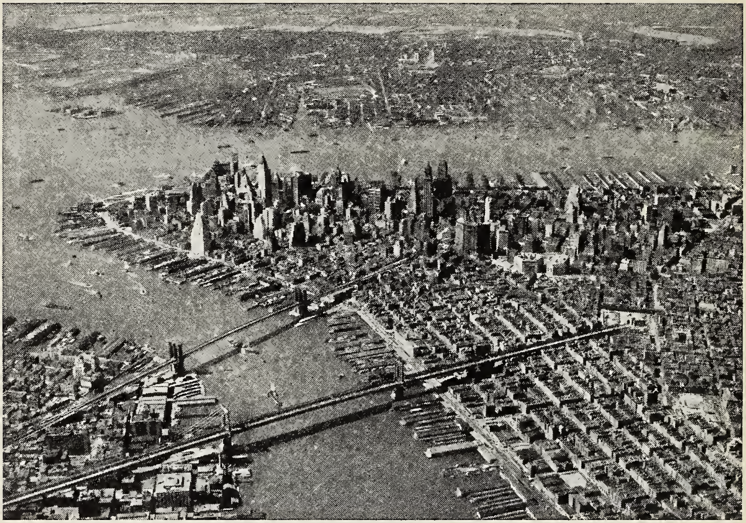

MONTREAL
Adirondacks
Highland of New England
Lake Ontario
BUFFALO
Lake Erie
CLEVELAND
BOSTON
PITTSBURGH
Appalachians
NEW YORK
PHILADELPHIA
BALTIMORE
WASHINGTON

The Mohawk Gate. The shaded area lies over 600 feet. The map brings out the easy route through the Appalachians to New York along the Mohawk valley, a tributary of the Hudson. All the other railway routes (shown by crosses), from Boston, Philadelphia, Baltimore and Washington, have steep climbs, long tunnels and much thinly-peopled country to cross.

There are nearly 125 million people in the United States, a mixture of many nations. The first colonists who came from North-West Europe settled in the thirteen original colonies along the Atlantic coast under British rule. There they became farmers and planters, tradesmen and sailors. From them came the frontiersmen who braved the dangers and hardships of forest and prairie and hostile Indians beyond the Appalachians.



Statue of Liberty in New York Harbour.

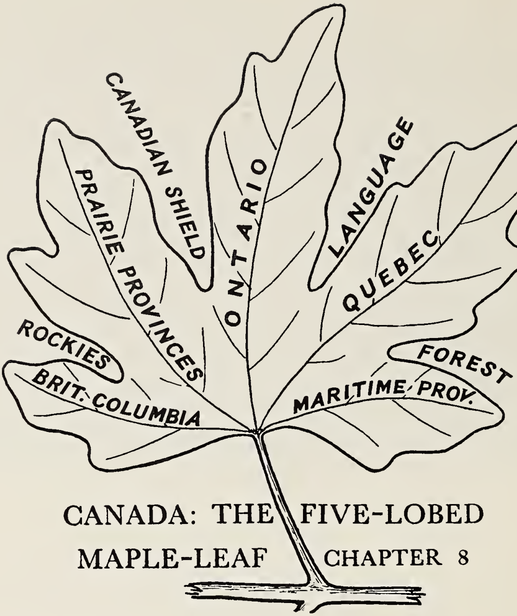


New York. The city stands on the narrow peninsula in the centre, between the Hudson River (far side) and East River (near side). Skyscrapers rise in the business heart of the city and the rectangular street plan, common in American cities, can be seen on the right. The importance of the port is indicated by the large number of landing stages for passengers and cargoes on both sides. The suburb of Brooklyn (left) on Long Island is connected by bridges, but the city on the far side only by ferries.

After the War of Independence their descendants built up the new nation state by state and they are still the leaders of the people today.

But fifty years ago the growing industries needed an enormous number of workpeople at low wages. From Poland, Russia, Italy and all the countries of Central and Eastern Europe newcomers arrived with new customs and new religions. They found work in the mines, factories and docks of the eastern states. From New York to Chicago the cities were filled with strange names and strange languages. There was a risk that so many strangers would never take on the true American pattern. After the War of 1914-18 a still greater inflow was feared. The Government therefore closed the door that had hitherto stood so wide open and limited newcomers to 150,000 a year.

The capital of the United States is Washington, which is neither a manufacturing city nor a great port. It was built on the beautiful river Potomac to be the capital and nothing else. Among its wide avenues and parks stand the White House, where the President lives, and the Capitol, in which Congress, the United States Parliament, meets. There, too, are magnificent monuments to the two greatest men in American history: George Washington, the hero of the War of Independence, and Abraham Lincoln, the President who abolished slavery.


CANADIAN SHIELD
ONTARIO
LANGUAGE
PRAIRIE PROVINCES
QUEBEC
ROCKIES
FOREST
BRIT. COLUMBIA
MARITIME PROV.

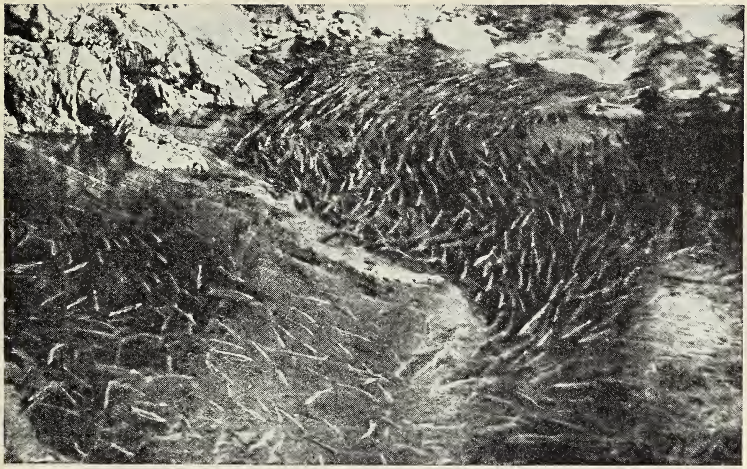
CANADA: THE FIVE-LOBED MAPLE-LEAF

CHAPTER 8

CANADA, though nearly as large as the United States, has only ten million inhabitants, and seven millions of these live east of the Great Lakes. It contains five main regions with five separate populations: British Columbia, the Prairie Provinces, Ontario, Quebec, and the Maritime Provinces (see diagram on p. 71).

The national emblem of Canada is the maple-leaf. Its five deep-cut lobes may remind us of these five divisions. But Canada, like the maple-leaf, is a living whole, nevertheless.

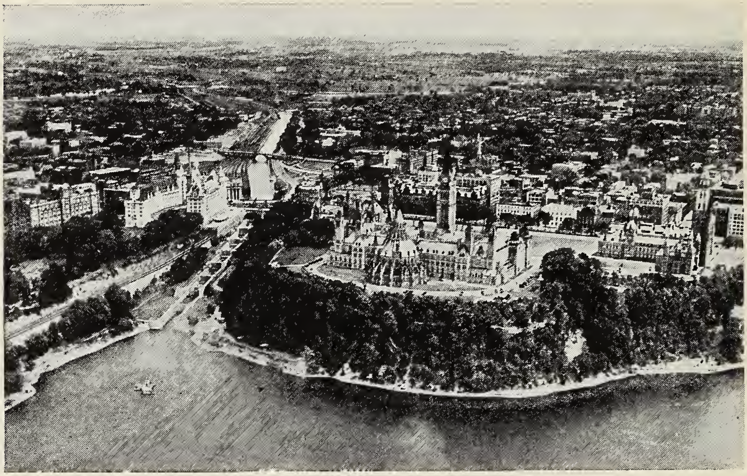
British Columbia is a mountain province with salmon canneries, lumber camps, mining townships and mixed farms.



Salmon in British Columbia Waters. Salmon ascend the Fraser and neighbouring rivers to lay their eggs in the upper reaches. The young fish spend the first year of life in the fresh water. In the second year they migrate to sea and remain there for three years. When four years old they again ascend the rivers to spawn and, after spawning, die. The photograph, taken from a high rocky bank, reveals the enormous numbers in the river in a good year.

Vancouver, on the mainland, is a great lumber and wheat port. Victoria, on Vancouver *Island*, is the capital. The population is mostly British-Canadian, though there are several thousand Chinese and Japanese.

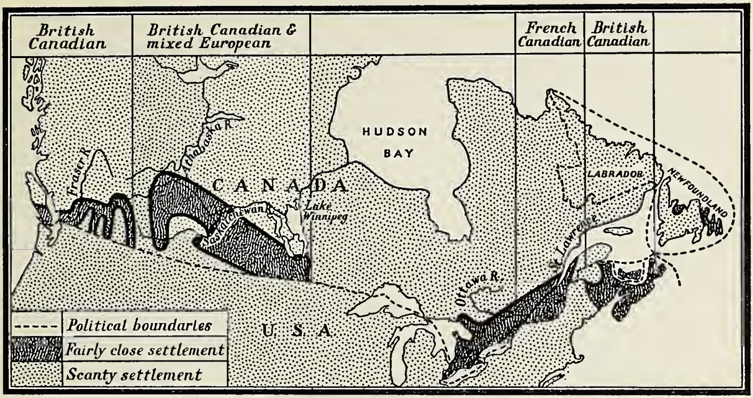
Beyond the Rockies the Prairie Provinces—Alberta, Saskatchewan and Manitoba—are the great growers of "spring wheat." Here settlers are advancing steadily into the fur-country of the north. The population is more mixed than elsewhere in Canada. Half is British-Canadian, but free grants of land have attracted experienced settlers from the United States as well as Europeans of many nations. The chief towns are Edmonton, Calgary and Winnipeg.



Ottawa. The Federal Parliament Buildings (centre) stand on a bluff overlooking the Ottawa River. The Rideau Canal comes from Lake Ontario and drops down the bluff by six or seven locks.

Ontario, with its mixed farming, its mining, manufactures and trade, is the richest province. Most of its $3\frac{1}{2}$ million inhabitants live east of Lake Huron, separated from the Prairies by 1,000 miles of forest and barren rock. Its British-Canadian population contains many of Scottish descent, for Scottish pioneers have done much to establish the Canadian nation. Ottawa in Ontario is the capital of Canada, a fine city built between two famous falls of the Ottawa River. Toronto lies on Lake Ontario, where curving sand-banks make a natural harbour; it is the " gate-way of the Lakes Peninsula." Hamilton, the " Birmingham of Canada," is at the western end of the same lake.

Ontario has no coal, and what she uses comes from the

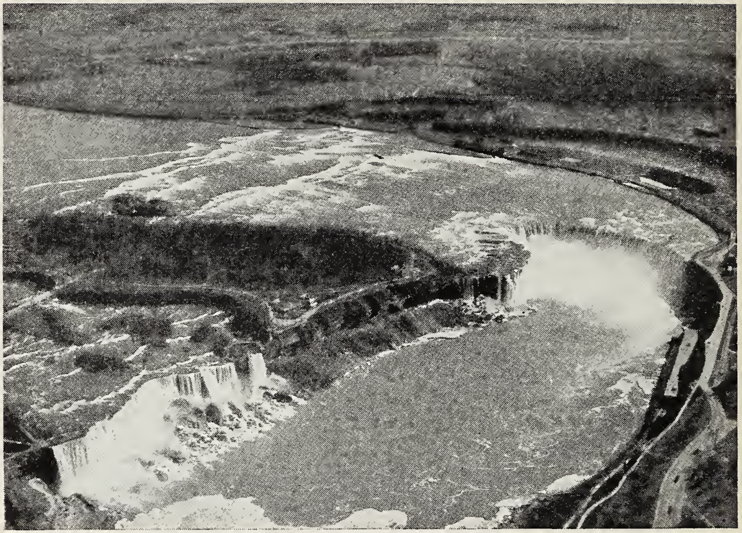

British Canadian
British Canadian & mixed European
French Canadian
British Canadian
HUDSON BAY
CANADA
U. S. A.
Fraser R.
Athabaska R.
Saskatchewan R.
Lake Winnipeg
LABRADOR
NEWFOUNDLAND
St. Lawrence
Ottawa R.
Political boundaries
Fairly close settlement
Scanty settlement

The Chief Settled Areas of Canada, as described in the text.

United States, for Canada's coal lies far to the east and west. Mines near the Rocky Mountains supply the needs of the Prairie Provinces. The two next largest coalfields are in Vancouver Island and Nova Scotia. These are convenient for steamships, but not for distant inland industries, though Nova Scotian coal is shipped as far up the St. Lawrence as Montreal. Both Ontario and Quebec rely mainly on water-power from the rivers of the Canadian Shield, and Niagara Falls supplies electricity to many towns. Even in winter, when the surface of the rivers and lakes is frozen hard, the deeper currents still run strong.

This cheap power serves many industries. We have already mentioned the gold and nickel mines of Ontario (p. 280). From Quebec Province comes most of the world's asbestos for resisting heat. Saw-mills, pulp- and paper-works use the forest timber, and the great towns manufacture textiles, machinery, food and chemicals.

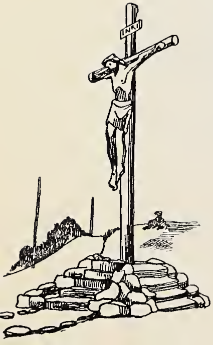
The Province of Quebec lies east of the Ottawa River. Three-quarters of its population is French by descent and



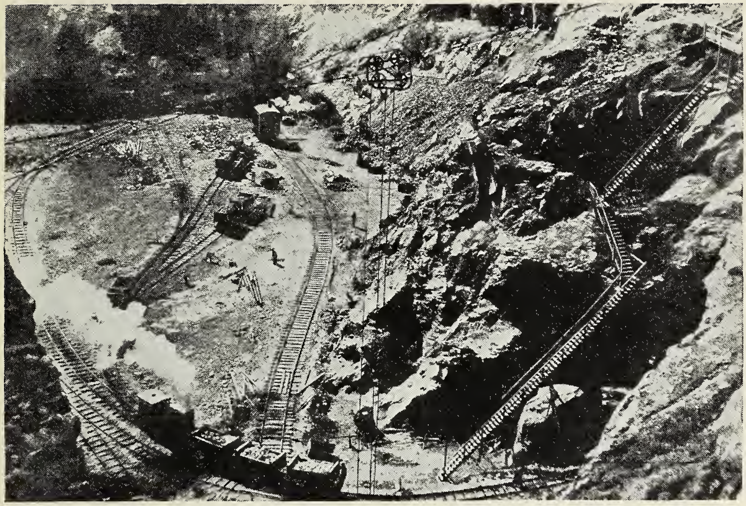
Niagara Falls, view from an aeroplane—the American Fall on the left, Canadian Horseshoe Fall on the right, Goat Island between, gorge and rapids below. The rock debris at the foot shows that the American Fall is retreating upstream and the curve of the Horseshoe Fall shows that the same process is at work there. Canadian power-plants can be seen on the right below the Horseshoe Fall; United States power-plants are below the American Fall but beyond the photograph.

still speaks French. The country-folk love their farms as the French peasants do, and like to supply their own needs in the old ways. Wool is still spun at home on the spinning-wheel, and ox-teams still work in their fields. Road-side shrines show their loyalty to the " old religion." As their numbers increased, the French Canadians spread westwards, and many also have crossed the border to work in the factories of the United States.

The old French fortress of Quebec still stands upon its



Wayside Shrine in Quebec.

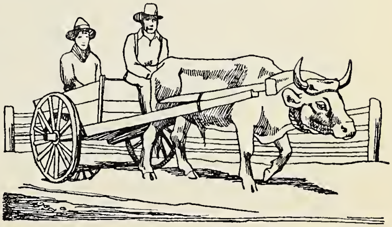


Asbestos Mine at Thetford in Quebec Province, south of the St. Lawrence.

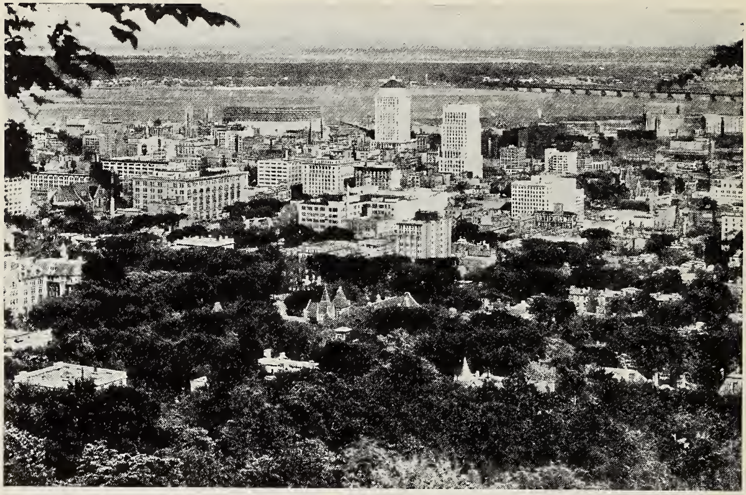
rock, and beside it are the finest buildings of the modern city. The Lower Town of narrow winding streets by the water's edge contains the business houses and the docks.

Greater Montreal is the only Canadian city of over a million inhabitants. It lies just below the last rapids of the St. Lawrence, which prevent ocean steamers going farther upstream. Here the railways from Ontario and from all the western wheatlands meet the ocean traffic.

The Maritime Provinces—New Brunswick, Nova Scotia and Prince Edward Island—are divided from Quebec by almost uninhabited forests. There are many French Canadians in New Brunswick, but the population is mainly British. Dairy-farming, apple-growing for the



French Canadian Ox Cart.

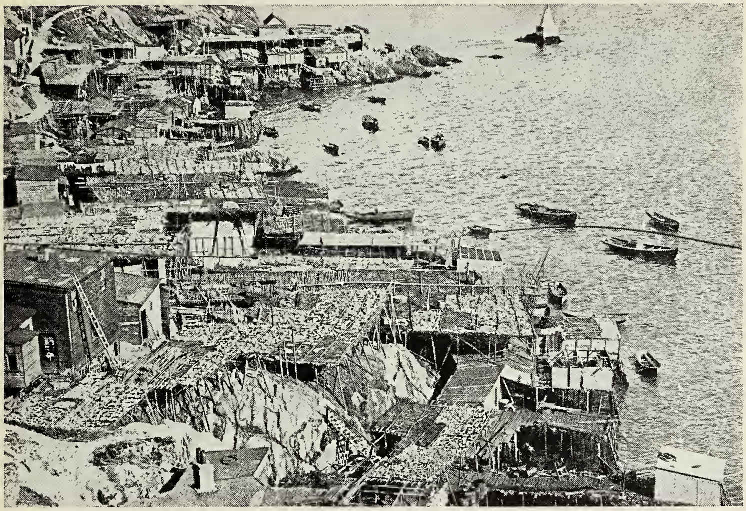


Montreal. View taken from Mount Royal (from which the city takes its name), and showing the St. Lawrence and railway bridge.

English market, lumbering and pulping, coal-mining and fishing are the chief employments. Halifax in Nova Scotia and St. John in New Brunswick have harbours never closed by ice, and some Canadian wheat passes that way in winter.

These five regions are linked together by great railways. The Canadian Pacific was opened in 1885. It spans the continent from Vancouver to Montreal, both ocean ports. It continues even further, for at Montreal it crosses the St. Lawrence and connects through the United States with the ice-free Canadian port of St. John in New Brunswick.

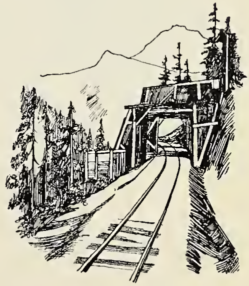
The east-bound train crosses British Columbia along lofty trestle bridges or on ledges cut in the steep mountain sides. It passes through tunnels that twist back at higher levels and under miles of snow-sheds which protect it against avalanches. It climbs the Kicking Horse Pass to the summit at 5,000



Newfoundland, Drying Cod in the Harbour of St. John's. Nearly all the population of Newfoundland is dependent, directly or indirectly, on the catching and curing of cod. Here the fish have been split and laid out on racks or " flakes " to dry. The dried cod is exported chiefly to Roman Catholic countries in the West Indies and South America, to be eaten when meat is forbidden. The fisheries of this part of the Atlantic are shared by Newfoundland, Canada, the United States and France.

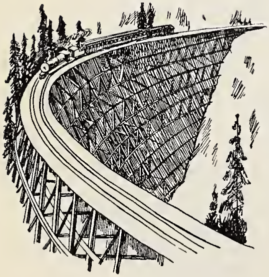
feet and comes down to Calgary. There the long slopes of the Great Plains take it to the longer levels of the Prairies. After Winnipeg come the torrents, lakes and forests of the Canadian Shield with only two towns of any size in 1,000 miles, then Ottawa, and so by the Ottawa river valley to Montreal. The whole journey is 3,000 miles.

Another railway, the Canadian National, crosses Canada from Vancouver by the Yellowhead Pass to Edmonton and Winnipeg. Then, swinging northward across the Canadian Shield, it ends at Quebec.

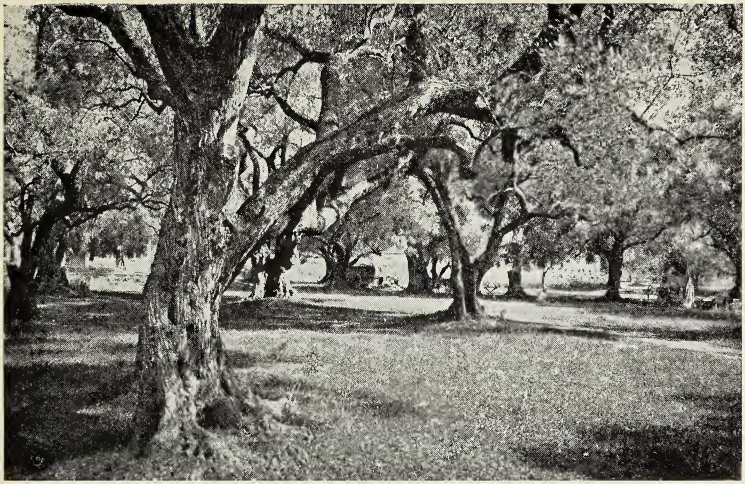


Snow-sheds.

Newfoundland, our oldest colony, is not a partner in the Dominion of Canada, but a separate government. Its capital, St. John's (do not confuse it with St. *John*, N.B. !) is the nearest American town to Europe. Fishing round the coast and wood-pulping in the interior are the main activities of a still undeveloped island. Part of the Labrador coast, useful for seal fisheries, is under the care of Newfoundland.



Old Wooden Trestle Bridge, of type now replaced by Steel.



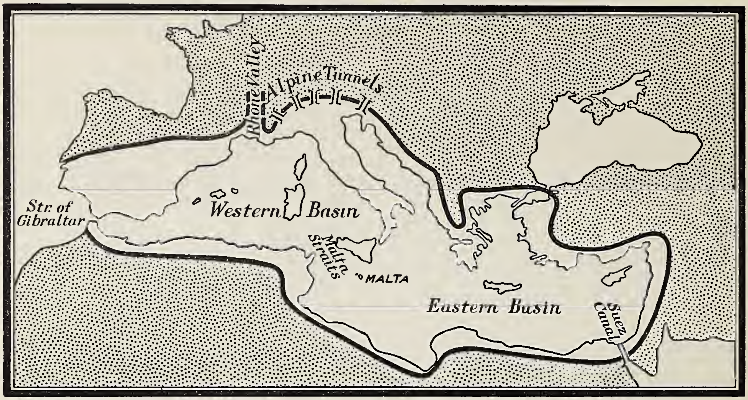
An Olive Plantation. The trunk is rough and dry-looking. The grey-green eaves are small and tough.

CHAPTER 9

THE MEDITERRANEAN

LET us take our first view of Europe from the Straits of Gibraltar, the entrance to the Mediterranean Sea.

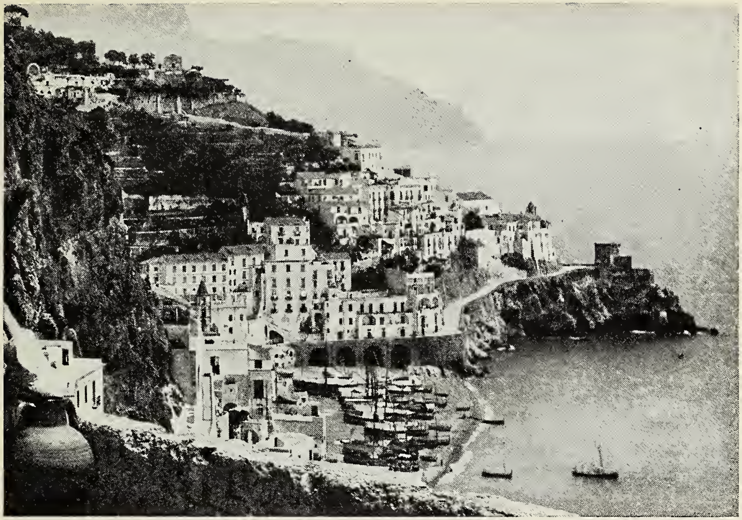
That great gulf lies more or less equally north and south of the latitude of Gibraltar, 36° North. It is, in places, over a mile deep and extends 2,400 miles eastwards. North-eastwards, if we include the Black Sea, it is longer still. Mediterranean means "in the midst of the land," and indeed it is almost encircled by the three divisions of that continuous land-mass which we might call *Eur-Afric-Asia.* It is a sea almost without tides or currents, so that the mud of its great rivers, such as the Nile and the Rhône, has never been washed away, but forms deltas. Ports like Alexandria and Marseilles lie on the nearest deep harbours clear of the delta sandbanks.



The Mediterranean Basin (shown white) is "surrounded either by high mountains or by deserts, both hard to cross." The map shows (*a*) the water-outlets at the two ends, (*b*) the northern land-exits by the Rhône Valley and by Alpine tunnels. The central land-bridge formed by Italy-Sicily-Tunis divides the whole into western and eastern basins, united through the Malta Straits.

The north coast is a series of peninsulas—the Iberian, Italian and Balkan. But the African coast is a smooth stretch with few harbours. All the islands, too, are off the north coast, and there are many, especially between Greece and Turkey.

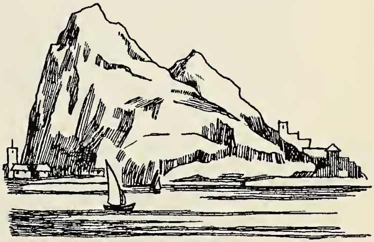
The Mediterranean is surrounded either by high mountains or by deserts, both hard to cross. Yet as a short cut to India and the Far East it is most important. Those regions of Asia contain half the world's population, and Europe holds another quarter. The trade between them is enormous. The Straits of Gibraltar and the man-made Suez Canal give passage to ships. On land the Rhône Valley is the easiest route to the north. But tunnels, such as the Simplon and St. Gotthard, have been cut through the Alps so that passengers and mails and certain goods may travel more quickly.



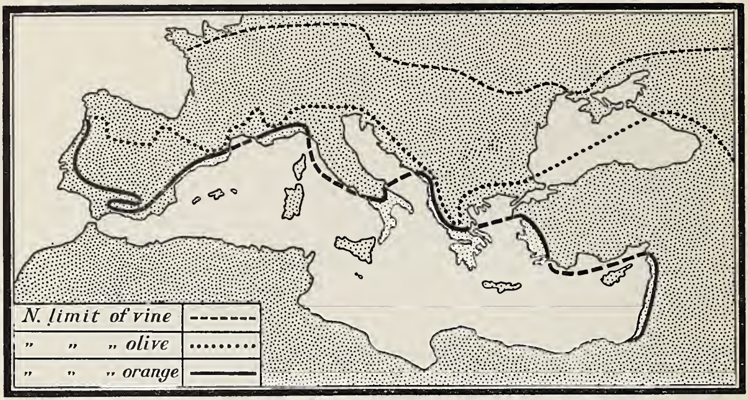
Amalfi. The situation is typical of many settlements in the Mediterranean. The town lies in a bay, separated from its neighbours by rocky promontories. A narrow beach serves as a resting-place for fishing boats. Above it streets and houses rise tier by tier up the steep slopes, and still higher there are cultivation terraces. The road winds round the coast cliffs; the railway runs in and out of tunnels.

For Britain, France and Holland, who have great possessions in the East, the Mediterranean route is essential, and Britain keeps watch upon its safety from Gibraltar and the Suez Canal at either end and Malta in the middle.

Though there are not many broad and fertile plains between the northern mountains and the sea, narrow strips and patches of good soil are common. The Mediterranean lands, indeed, are reckoned among the most favoured in the world. Like California and some other regions in similar latitudes, they lie in that part of the



Gibraltar—"The Rock."

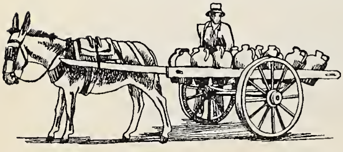


Northern Limits of Olive, Orange and Vine. The olive grows all over the Mediterranean region, but not outside it. The orange requires warmer conditions. The vine, so long as it gets strong summer sun, can stand cold in winter; it is common in Mediterranean countries, but it also grows and ripens well to the north.

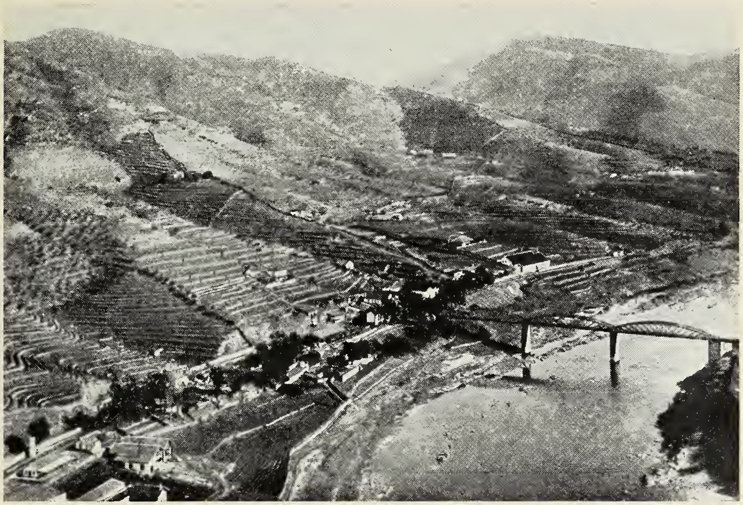
Warm Belt where the drying north-east Trade Winds start in summer. In winter the Westerlies, drawn south with the southward moving sun, bring most of the rain the Mediterranean gets.

This kind of climate, with winter rains and summer drought, is called the Mediterranean climate. There is abundant sunshine, and the snow that falls on the mountains in winter melts in the early summer and fills the rivers after the rains on the lower ground have ceased. So the summer droughts may be relieved by careful irrigation, and rich supplies of corn, and fruit, and wine reward the farmers for the hard work it costs them.

The vegetation of the Mediterranean countries is especially suitable for the climate. The trees and shrubs are mostly evergreen, for they must make full use of the winter rains. But their leaves are thick, like the laurel's, to prevent the loss of precious moisture when the summer sun is hot. Flowering bulbs, like the daffodil, make their growth before the drought



A Water-seller in Spain.



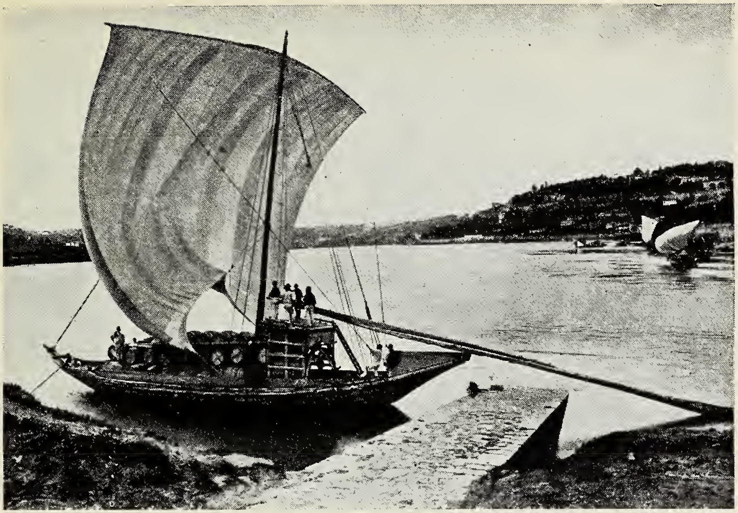
Terrace Cultivation. The hillside is terraced far up, and the soil is kept in place by stone walls. The terraces here are planted chiefly with vines.

begins and then die down till the winter rains revive them. Trees, such as the olive, send their roots deep down to find the sunken water-supplies when the surface soil is parched. Fruits, such as oranges and lemons, preserve their juices by the thickness of their skins till the seed is ripe.

The people of the Mediterranean depend especially upon their grape-vines and olives. Good water is often not to be had, and wine made from the grapes is drunk instead. In such a climate there is also little summer pasture for cows. Butter is therefore an expensive luxury, and its place for food and in cooking is taken, not by margarine, but by olive oil. Cattle, indeed, are used chiefly to draw carts and ploughs: little meat is eaten, but much bread and vegetables. Sheep and goats are plentiful, for they can scramble up to high pastures more easily than larger animals. In summer they are driven up into the mountains, for grass grows more freely where the winter snows have lain.

On the lower slopes terraces are built, with channels into which the mountain streams are led to water fruit-trees. In the valleys, wheat and maize are grown wherever possible; and every harbour has its fishermen to vary and complete the food supply.

The Mediterranean has known many changes of fortune since the days when the Romans ruled it all from their central city. In the Middle Ages the gold and rubies, silks and spices of Asia came overland by caravan to its eastern shores to be exchanged for the wool, hides and metals of Europe. Cities like Venice and Genoa grew wealthy in the Mediterranean carrying trade. But when the Portuguese, whose country lies outside the Mediterranean, discovered the route round Africa to the East, they struck a mortal blow at this traffic. The cost of transport was halved by the unbroken sea journey, and the proud merchant-cities of the Mediterranean found that their trade had vanished. That sea no longer led anywhere, and prosperity did not return to it till the opening of the Suez Canal in 1869 made it once more a highway of Eastern commerce.



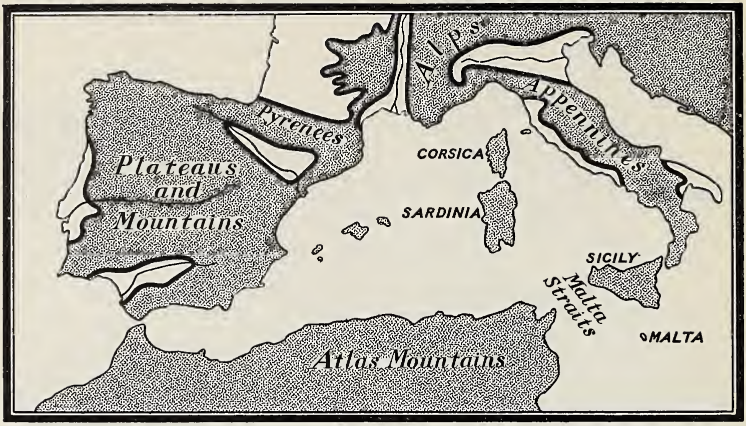
Wine boat on the Douro in Portugal. The vessel has loaded barrels of wine at the river bank and is taking them probably to Oporto near the mouth. The square sail is large, and the boat is moved and steered with the long oar, manned by four men.

CHAPTER 10

THE MEDITERRANEAN PENINSULAS

THE Iberian Peninsula contains Spain and Portugal. Its core is a high plateau, divided by high mountain ranges and deeply cut by rivers such as the Tagus. Round it lie the lowland valleys of three rivers, the Ebro, Guadalquivir and Lower Tagus (which flows through Portugal). Behind the Mediterranean coast there are more mountains.

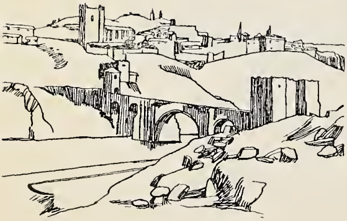
Atlantic winds bring good rains to the north-western fringes of the plateau. There, forests and orchards, meadows and dairy-cattle prosper, and the coastal strip has many inhabi-



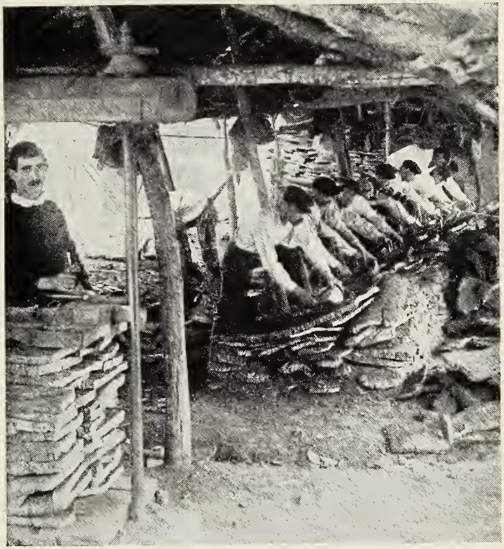
The Western Mediterranean Basin is surrounded by high lands (shaded); the chief natural outlets by sea and by land are shown. From the centre rise the mountainous islands of Corsica and Sardinia. The chief lowlands (white) of the Iberian and Italian Peninsulas are also marked.

tants. But most of the plateau is very short of rain. Towards the west, wheat and cork-oak forests grow, but the east is too dry for crops or cattle. Only shepherds wander there with their flocks; towns, and even villages, are few and far between, and roads are mere tracks. But the plateau is rich in iron, copper and other minerals, particularly along its northern and southern edges. Bilbao, for instance, exports much iron to Britain.

The Ebro and Guadalquivir lowlands and the Mediterranean coastlands are very fertile, but only when irrigated. Vines, olives, and oranges are grown there, often on watered terraces. The Mediterranean coast has a large population especially round Barcelona, where textile and engineering industries employ many hands.



Walled Town in Spain.

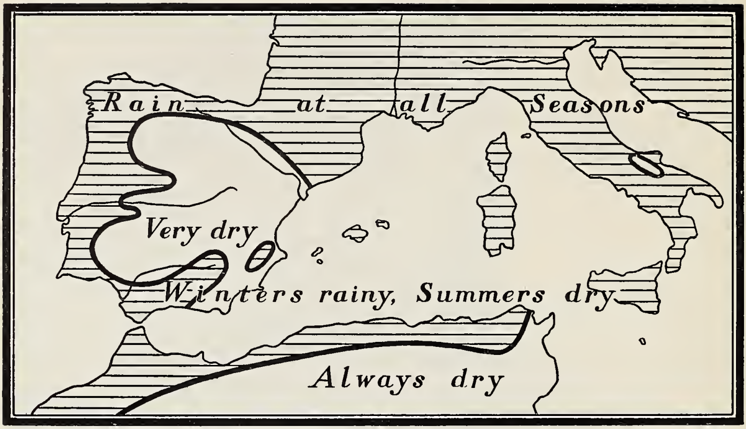


Cork. The thickness of the bark of the cork-oak is seen in the picture. The men are scraping the rough outside and pressing flat the curved sheets stripped off the trunk.

Spain makes much olive oil, and oranges are exported from Seville and Valencia. Fresh grapes, sun-dried raisins and wines are produced in many districts, and the thick, rugged bark of the cork-oak provides both corks for bottles and cork-dust for packing the grapes.

But money is scarce in Spain, and farming suffers not only from drought but from backward methods. Few landowners can afford to improve their estates. Modern machines have not yet replaced the ox-drawn carts and ploughs. Many labourers can neither read nor write, and all are very poor.

Few capitals are so centrally placed as Madrid, yet the government in that wind-swept, sun-burnt city has rarely found it easy to control the country. Mountain-barriers separate the different provinces from each other and from the capital. The industrial regions of the north, round Bilbao and Barcelona, have shown a vigorous and sometimes violent independence.

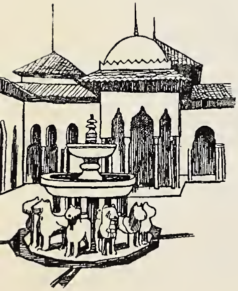


Rainfall over the Western Basin. Most of the northern part has rain in all seasons; the southern is dry in summer. A large area in central and eastern Spain has little rain in any season.

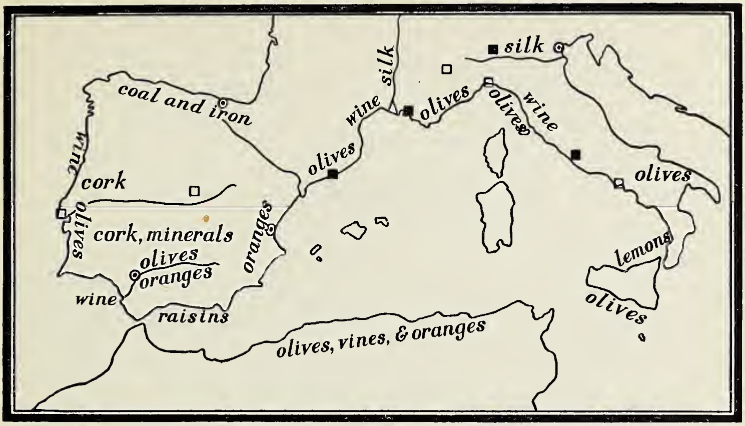
Many of Spain's troubles are due to her history. For 700 years she was busy fighting Moorish conquerors from Africa. Then for 300 years she lived on the wealth of her American Empire. When that was lost, the Spaniards were quite unfitted to make their living, as other nations did, by trade.

Portugal's capital and chief port is Lisbon, on the Tagus. Her products are wine, fruit, cork and tinned fish, and her best customer is Britain. Her famous seamen won her an empire overseas, of which much remains to her, especially in tropical Africa.

Italy's peninsula is fenced from the rest of Europe by the Alps, as Spain is by the Pyrenees. The northern plain drains eastwards to the Adriatic Sea, whose waters once filled the broad hollow between the Alps and the Apennines. But the tributaries of



Court of Lions, Granada.

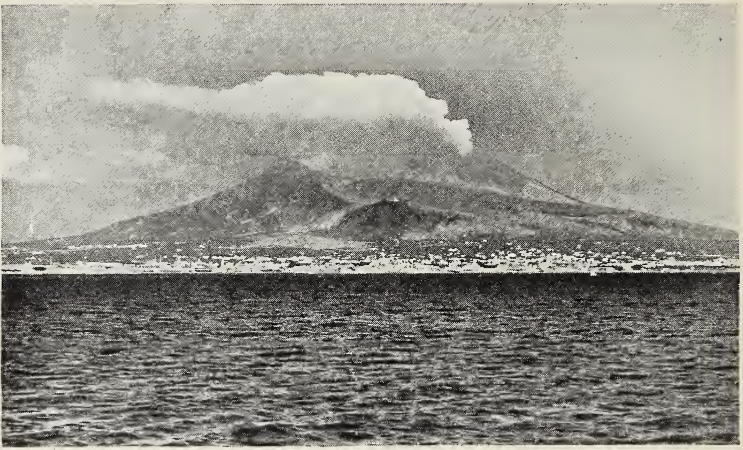

coal and iron
wine
cork
olives
cork, minerals
olives
oranges
wine
raisins
oranges
olives
wine
silk
silk
olives
olives
wine
olives
lemons
olives
olives, vines, & oranges

Products of the Western Basin. Notice how frequently the typical Mediterranean fruits—olives, vines, and oranges—are named. The more tender lemon is grown mostly in Southern Italy and Sicily. Minerals are marked along the northern and southern edges of the Spanish Plateau.

the River Po have washed the waste of these mountains into the hollow and built the Plain of Lombardy, and the Po itself is still spreading its delta further into the Adriatic.

Like Northern Spain, Lombardy gets rain at all seasons, but irrigation is also necessary. Farmers grow crops for food, such as wheat, maize and even rice, or for industry, such as hemp; but the chief crop is hay. The cattle it feeds, supply the milk for famous cheeses such as gorgonzola. In the sunny Alpine valleys silk-worms are reared on mulberry leaves.

Industry is making rapid strides, though Italy has little coal and few raw materials. Her many Alpine rivers, however, provide electricity. The Plain is covered with overhead electric lines carrying power to both towns and villages. So Milan and Turin make woollens, cottons and silks (both natural and

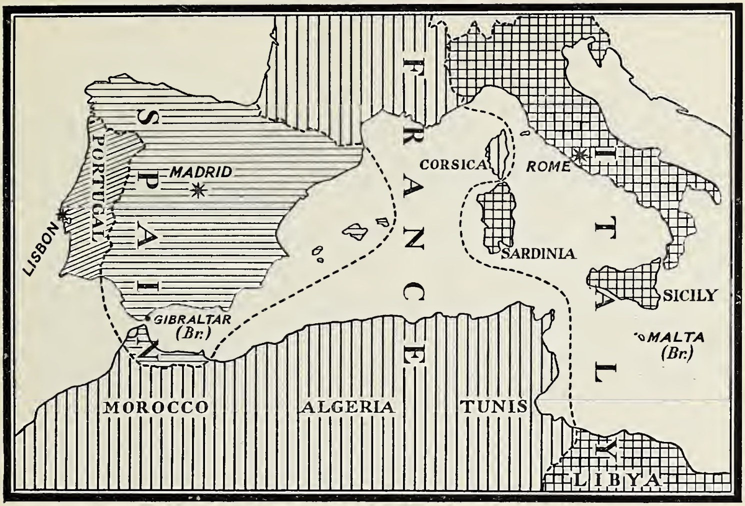


Vesuvius. The present cone is blunt-topped. The crater inside is about a quarter of a mile across and is sending out a cloud of steam. The curved ridge on the left is all that is left of an older and larger crater; the explosion which built the present cone blew away the rest of the rim. The city at its feet is Naples.

artificial), and machinery of all kinds. Turin is particularly famous for its motor-cars. Genoa, the chief port for the Plain, builds fine ships with steel made from imported coal and scrap-iron.

Except for its cities, Southern Italy makes slow progress. The Apennines cover most of it, though there are carefully cultivated lowlands on the western coast, especially round Florence at the bend of the River Arno, and Naples at the foot of Mount Vesuvius. The people live in villages often far from their fields, not in farmhouses as in England.

Summers get drier towards the south, but there is much unhealthy marshland, which is gradually being drained, especially near Rome. Estates are often neglected, and more

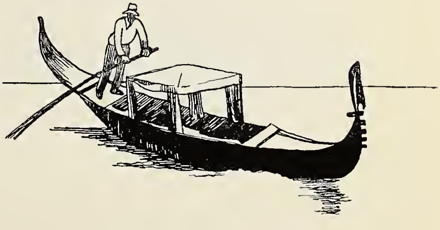

SPAIN
PORTUGAL
MADRID
LISBON
GIBRALTAR
(Br.)
FRANCE
CORSICA
SARDINIA
ROME
ITALY
SICILY
MALTA
(Br.)
MOROCCO
ALGERIA
TUNIS
LIBYA

The Countries of the Western Basin. Each possesses (*a*) islands, (*b*) parts of Northern Africa. Gibraltar and Malta are British naval stations, protecting the sea-route.

irrigation is needed. The labourers are as poor and uneducated as in Spain. The chief crops are wheat (from which macaroni is made), grapes, olives and oranges. Lemons are less hardy, but they grow well in Sicily.

Though the Cape route ruined many Italian cities, their works of art, as at Florence and Venice, are still famous. But the opening of the Suez Canal and the Alpine tunnels brought renewed prosperity to Genoa and other cities; and Brindisi, on the heel of the peninsula, has become an important port for mails and passengers to and from the East.

Italy has a population of over 40 millions, nearly twice that of



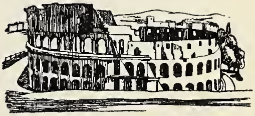
A Venetian Gondolier.

Florence is situated on the Arno where the river leaves the hills and turning westwards, flows across a fertile plain. The city lies on both sides of the river. The bridge is the Ponte Vecchio and is bordered by old shops; it was round this crossing-place that the city grew up.

Spain; and it increases rapidly. There are many Italians in North Africa, the United States and South America, but nowadays few leave Italy for foreign countries. The Government is trying to provide for the growing population by improving agriculture, breaking up the big estates into small holdings, and by developing Italy's African colonies.

To Greece, the last country of the Balkan peninsula, fate has been unkind. Nowhere in the Mediterranean are valleys so narrow or mountain barriers so troublesome as in Greece, and much of her territory consists of scattered islands. Nowhere, therefore, has national unity, which depends on easy communication, been harder to establish. Her soil is poor, her minerals are few, and she has little to export but currants (named from her town of *Corinth*) and tobacco. The government at Athens finds it hard to make both ends meet either in money matters or in politics.

As they live close to the sea on rocky peninsulas and islands, the Greeks have always been sailors and traders as well as farmers. They have spread round the coasts of the Eastern Mediterranean. They are to be found also in more distant lands, including England, as merchants and shopkeepers. On the other hand, many visitors from western nations are attracted to Greece to see and to study the ruins of temples and other relics of a glorious past. For the architecture, art, literature and science of Ancient Greece, side by side with Roman law and government and the religion of Palestine, have made the noblest contributions to their civilisation.



Ruins of the Coliseum at Rome.

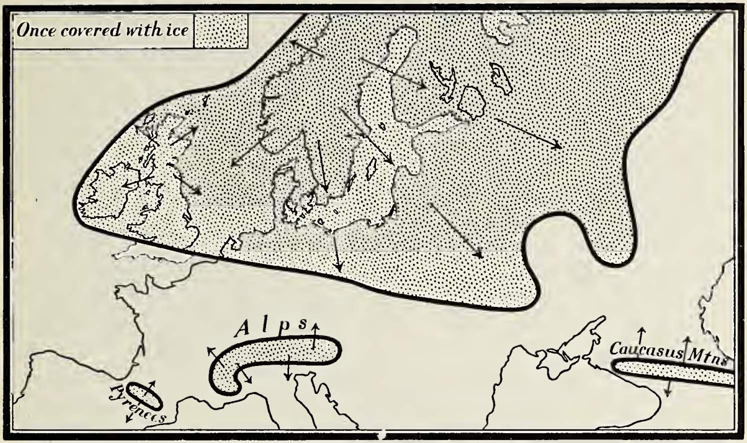
The Aletsch Glacier in the Swiss Alps.

CHAPTER 11

100,000 YEARS AND MORE OF EUROPE

SEAS and lands, mountains and valleys have changed places many times since this world began; warm climates have turned cold and, later, warm again. Two events have changed the face of Northern Europe in times not very remote: the Ice Age and the overflow of the Atlantic.

The great plain that stretches from Wales to Russia was once a continuous land surface, and its climate became very cold. A vast sheet of ice spread over it from the north, reaching to the mountains of Central Europe. The glaciers of the Alps and Pyrenees, those slow-moving rivers of ice found only in the highest valleys now, extended to the valleys below.

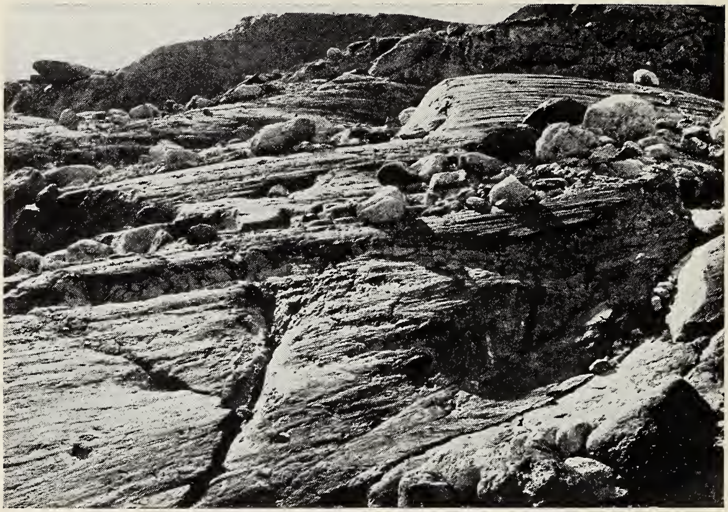


The Limits of the Ancient Ice Sheet. The ice sheet covered most of Northern Europe, including the British Isles as far south as the Bristol Channel and the Thames. The arrows show the directions in which the ice moved.

The northern half of Europe must have looked like modern Greenland, and its few inhabitants like Eskimos.

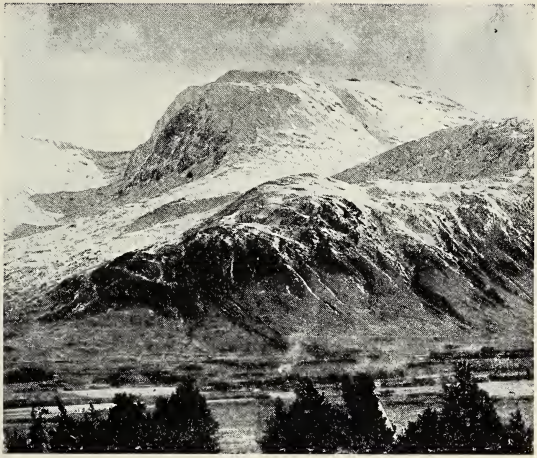
The picture shows a present-day scene in the high Alps of Switzerland, with rocky ridges, snow-fields and, in the valleys, glaciers. The jagged ridges, broken up by the action of frost, stand up above the snow-fields. On the gentler slopes snow lies all the year round. Every storm piles more on top of it. As the thickness increases, the weight squeezes the air out of the layers underneath, just as squeezing a snowball turns the snow into ice. The weight also pushes the ice-mass down the valleys as glaciers.

The main glacier in the picture is moving, perhaps a foot in twenty-four hours, from right to left. Several tributary glaciers join it. They start in the snow-fields above and tumble in masses of broken ice like rapids in a river.



The Work of a Glacier in the Alps. The rock has been smoothed by an old glacier, now melted. The loose stones, frozen into the bottom of the ice, acted like files and did the smoothing. In some places they made grooves and rough stones made scratches. These show which way the glacier moved. Which way did it move ?

Along each side the main glacier is carrying bands of gravel and rocks which have rolled down from the bare slopes above. These bands are called moraines. When two ice-streams join, their inner moraines become one central moraine. There are two of these near the middle of the picture. Some of this rock-waste sinks through cracks so that the ice becomes full of it and like a file scratches and smooths the surface it passes over. All this waste material is carried along to the end or snout of the glacier. Where the ice finally thaws at lower and warmer levels, the gravel and boulders are left in heaps across the valley. This rough embankment is the last of the moraines. But the finer material is washed out and carried



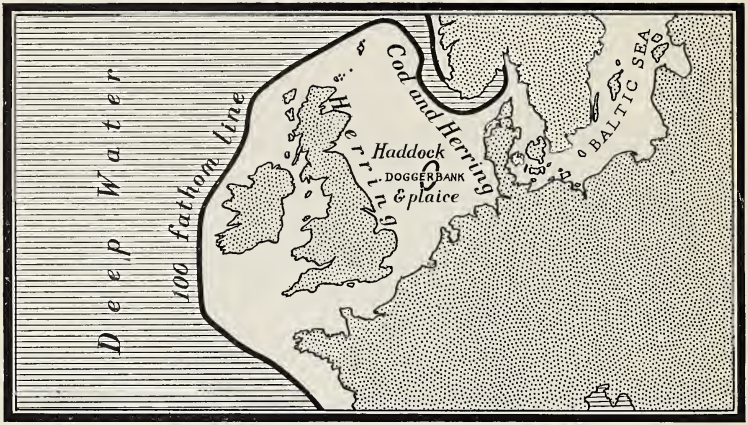
Ben Nevis in the Scottish Highlands. The view shows the general smoothed and rounded surface that is characteristic of lands over which the Ancient Ice Sheet moved. Lumps of debris—rock, gravel and sand—here covered with grass, can be seen on the left at the foot of the mountain. (See also illustration, p. 478.)

down by the stream which flows from the melting ice. (See also illustration, page 361.)

So, when the climate of Europe changed and the ice shrank back northwards or upwards into the high mountains, its work remained. The second picture shows rock-surfaces smoothed by the ice which once covered it. Rougher pieces of rock scratched the polished surface, and the direction of the scratches shows that the ice was moving from right to left. The boulders are some of the tools with which the old glacier did its work, left behind when the ice disappeared.

Country over which ice has passed has a general smoothed and rounded appearance, as seen in the Scottish Highlands on this page. Elsewhere, grass-grown moraines or beds of finely ground and fertile clays may show where ice once stood. We have met its traces in Canada; we shall meet them again in Northern Europe and in the British Isles.

Not only has the lowland of North Europe been buried



The Shallow Seas of North-West Europe. While the Mediterranean is in places more than a mile deep, these northern seas are under 100 fathoms. The 100-fathom line marks the edge of the continent, where it drops down to the deep Atlantic. The British Isles therefore are surrounded by shallow seas, and the Baltic is also shallow. If St. Paul's Cathedral were placed on the Dogger Bank, the dome would rise above the surface.

under a thick sheet of ice, part of it has been drowned by the Atlantic. But, unlike the ice, the Atlantic has not retreated again. The overflow has created the shallow North Sea and the Baltic; it has separated Ireland from Great Britain and Britain from the continent of Europe.

On any map which shows by different colourings the depth of the sea, the ghost of the old land surface may be seen. It can be traced from the Bay of Biscay, round Ireland to the Shetland Islands, and almost to the coast of Norway; an area larger than the islands that remain. From its floor, fishermen sometimes bring up the teeth or bones of ancient animals which lived there when it was dry land.

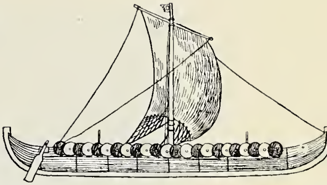
But this sinking of the land has not been all loss to the surviving coasts. Ships can now carry men and cargoes far into the heart of the continent. We do not in these islands regret the sea which has protected

> "This fortress built by Nature for herself
> Against infection and the hand of war."

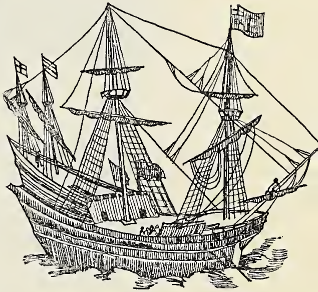
Over the shallow "continental shelf" the tides sweep up and down twice daily, washing our coasts clean. The sea has entered deeply into the river valleys, from North-West Spain to Northern Scotland and made many convenient harbours; the Bristol Channel and the Thames Estuary are only two examples. Even the drowned lands themselves have not ceased to be useful to man. They are the haunts of a great variety of fish which come there to feed and breed. The shallows of the North Sea, and particularly the Dogger Bank, make one of the most valuable fishing-grounds of the world. All round our islands the drifters and trawlers are busy.

The skill and courage needed for the handling of fishing-boats in stormy seas made the coast-dwellers of Northern Europe daring sailors. The "long ships" of the Norsemen reached Greenland and even North America long before the days of Columbus; and their descendants, the Norwegians of today, are hardy seamen still. The Iceland and Newfoundland cod tempted the French and British, the Portuguese and Spaniards to risk the Atlantic gales.

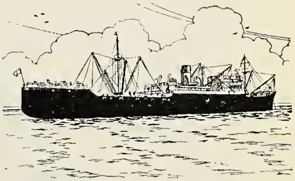
From fishing to trading is an easy step when experience has taught men how to build good ships. So the people of the German coasts with their headquarters at Lübeck became famous traders in the Middle Ages. The Dutch became



Viking Ship 1,000 Years Ago.



Elizabethan Ship 400 Years Ago.

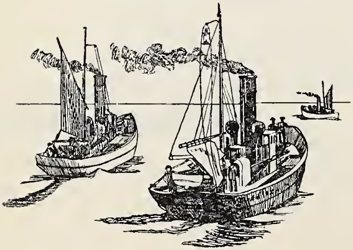


Modern Cargo Steamer.

North Sea Herring Fishery. Shooting the nets.

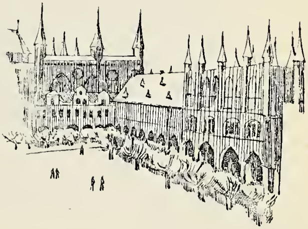
a nation of merchant seamen, and Holland one of the great sea powers of the world.

Britain's long coastline gave her a larger proportion of seamen than her rivals. She had the further advantage of possessing no land frontiers to protect. All her enterprise found its outlet upon the sea, where her navy won her at last the foremost place. A world-wide commerce, thanks to such benefits, was built up by her rulers and her merchants. The immense wealth so gained provided the money for developing coalfields, building factories and laying down railways. These gave Britain a century's start over other countries in becoming the workshop of the world. Later, the states of North-Western Europe followed Britain's example. The English Channel—and the East Anglian Channel which matches it on the other side of the

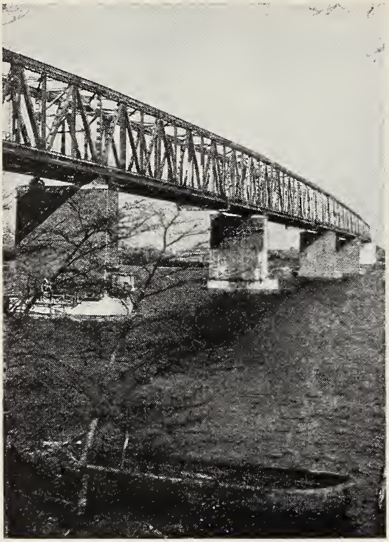


Herring Drifters.

Straits of Dover—became the busiest sea-traffic lane of the world; and from this her ports have profited enormously. Her great overseas Empire must be reckoned the reward of her qualities, but some of these, at least, may be traced back to the accident which cut her off from Europe thousands of years ago.



Lübeck Town Hall.



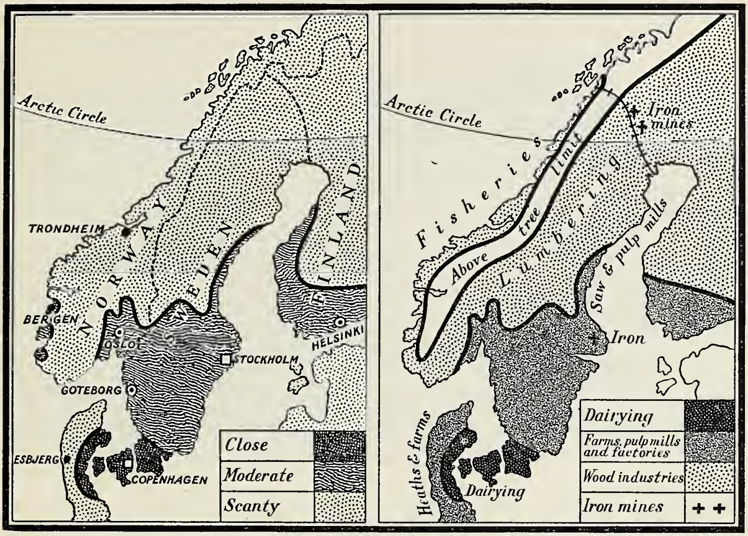
Denmark. By means of bridges and train-ferries passengers and cargoes without changing travel across the peninsula and islands. This is the railway bridge across the Little Belt, joining the mainland to the island of Fyen.

CHAPTER 12

SCANDINAVIA AND FINLAND

SCANDINAVIA includes Denmark, Norway and Sweden, three countries with many differences, but inhabited by peoples who are related in blood and language.

Denmark shows what a go-ahead nation can do to change a poor land into a prosperous dairy farm. The country is a lowland, and the ancient ice sheet has left it covered with sand to the west and clay to the east. A train journey from Esbjerg to Copenhagen takes one at first through scattered farms and pastures among heather-covered slopes and pine-woods. That is the sandy side. But further east and on the islands the clay soil grows more crops and one sees neat white-washed villages and little dairy farms. More grassland has here been ploughed to produce cattle-fodder, the soil has been improved with chemical manures, and the yield

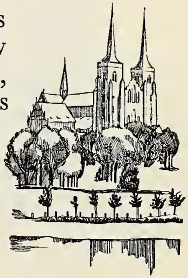

Arctic Circle
TRONDHEIM
NORWAY
SWEDEN
FINLAND
BERGEN
OSLO
STOCKHOLM
HELSINKI
GOTEBORG
ESBJERG
COPENHAGEN
Close
Moderate
Scanty
Arctic Circle
Fisheries
Above tree limit
Lumbering
Iron mines
Saw & pulp mills
Iron
Heaths & farms
Dairying
Dairying
Farms, pulp mills and factories
Wood industries
Iron mines + +

Scandinavian Countries. Distribution of population (left), and of occupations (right).

of crops and milk has been doubled in the last seventy years. Even the sandy western soils have been made more fertile.

Most of the farms are under 15 acres and are worked by their owners with the help of their families. The Danes have learnt the value of combining to send their milk to the butter factories, to advertise and sell their produce, and to buy fertilisers, seed and machinery. Denmark is a land of successful small-holders.

Copenhagen, the "butter market of Europe," is the capital and chief port. It lies on the narrow waters of the Sound. But a new port, Esbjerg, has been built on the west coast, since Britain is



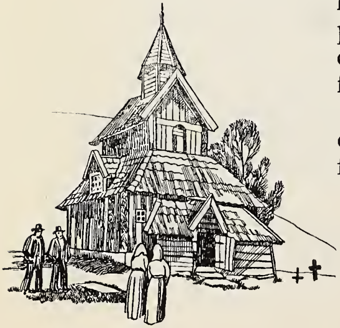
Roskilde Cathedral, Denmark,
Burial-place of Kings.

Norway. A large farm in the gentler country behind Oslo. It is well kept and prosperous-looking. In front of the large stable and barn, the stooks of grain are raised off the ground on posts to hasten drying in this cool northern land. On the left is a church.

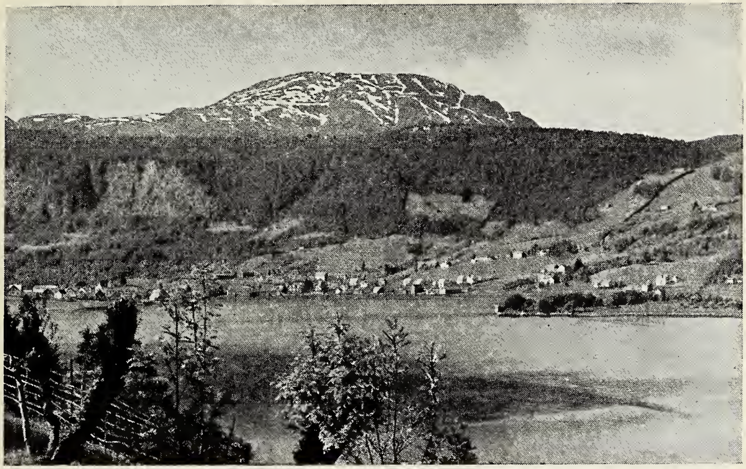
Denmark's best customer. In exchange for butter, eggs and bacon, Denmark buys our coal, foodstuffs, and chemical manures.

Mountains separate Norway from Sweden down most of the peninsula which they share, but Oslo, Norway's capital, lies east of them. The south-eastern corner is the most productive part of Norway. Here are the chief farms and the largest forests. Rapid streams provide the electrical power for sawmills and pulp-works and chemical and metal industries. Here, therefore, we find half of Norway's population.

On the west a lofty cliff-bound plateau comes down to the sea. Narrow steep-sided fiords cut deep into the land, and off the coast



A Norwegian Wooden Country Church.



Norway. The village is on a branch of the Hardanger Fiord. Houses and fields are on the narrow, gentler slopes near the water. The side soon steepens and is covered with forest up to a ledge on which there are other houses. Above, the slopes rise to a bare dome, rounded and smoothed by the ice of long ago and now only streaked with snow.

lie countless rocky islands. Behind this "skerry-guard"* steamers and fishing boats can travel up and down the coast in smooth water.

Here Norway faces the westerly winds and warm waters of the North Atlantic. But farming is only possible on the flat land at the heads of the fiords or the ledges along their sides. Small hamlets or lonely farms with wooden houses, each with its landing place and boats, are the only signs of habitation. Round them lie small fields of rye, oats or potatoes, with hay or turnips for the cattle in winter. In summer they graze on the wide mountain sides.

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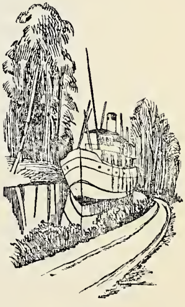
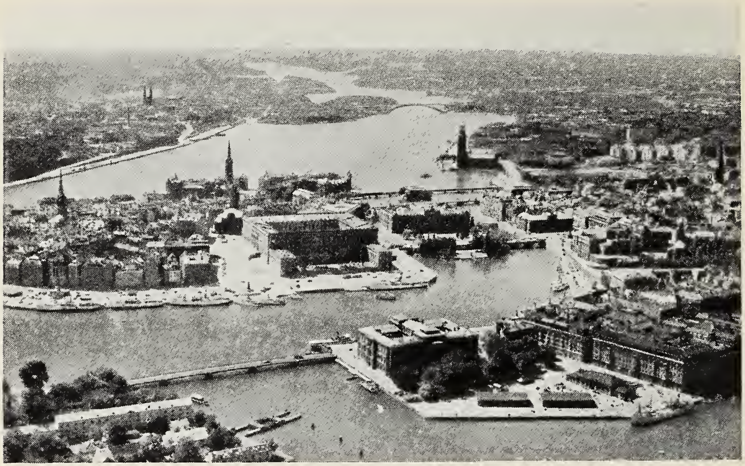
* Skerries are rocky islands.



Steamer on the Göteborg Canal, Sweden.



Sweden: Stockholm. The island in Lake Malar on which the city was founded is in the middle of the picture. On it is the old part of the present city, the Royal Palace (centre) and Houses of Parliament (right); ships are at the quays. The large square building in the centre foreground is the National Museum. Many bridges connect the islands.

In such a country men must look to the sea for a living. Farmers turn fishermen in their spare time, and Bergen is a great port for cod and herring. In the early spring the cod appear in shoals round the Lofoten Islands. The catching, cleaning and drying of the fish employs some 40,000 men, women and children. Much of the dried cod is sold to Roman Catholic countries for eating on fast days. Norwegian whalers do a profitable business in the distant Antarctic, and Norwegian " tramp-steamers " carry the goods of other nations across all the seas of the world.

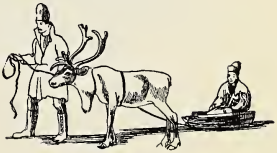
Norway therefore consists of two parts: the Oslo region with its many farmers, lumbermen and factory hands; and the western fiords and islands with their scattered farmer-fishermen and the seamen of the ports. Two wonderful mountain railways from Trondheim and Bergen unite the western districts to the capital.

Sweden has wider lowlands and deeper soils than Norway. South of the River Dal much of the natural forest-cover has been cut down to make room for farms. The richest soils lie in the south and in the broad hollow which contains the great lakes. The largest, Lake Vener, is an important link in the canal which joins Stockholm, the capital, to the ice-free western port of Göteborg. Iron is found on the edges of the hollow, and the manufacturing towns round Lake Vener can be reached by ocean ships. Iron mines and forests supply the raw materials for electrical apparatus, doors and window-frames, paper and matches. Germany and England are Sweden's best customers. Like Norway, Sweden has no coal, but electricity supplies power, heat and light for every purpose.

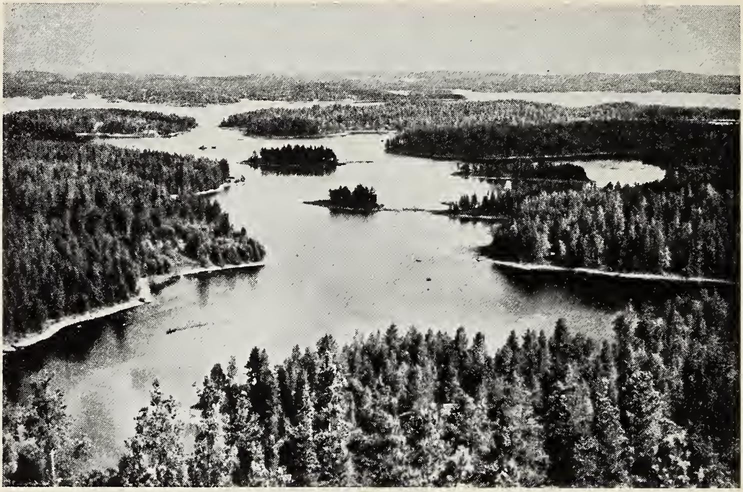
Stockholm, the " Venice of the North," is built on islands at the foot of a beautiful lake, but another forty miles of islands separate it from the open sea. In winter it is often icebound, for the warm winds of the Atlantic seldom cross the mountains.

North of the Dal the virgin forest of pine and fir still covers most of the country. Sawmills and pulping mills line the coast at the mouths of the rivers. Within the Arctic Circle in Swedish Lapland there are hills of iron ore. Only high wages will bring miners so far, supplies are also expensive, and flood-lighting is necessary in the open pits during the dark Arctic winter. Yet the ore is so rich that it pays to work it. An electric railway joins the mines to an ice-free port in Norway.

Of all these northern countries Finland shows most plainly the work of the ancient ice sheet. Between the low smooth hills thousands of lakes wind in and out along the hollows. Indeed the Finns call their country *Suomi*, the "Land of Lakes." Many journeys are made by water, and the frequent waterfalls supply



Reindeer and Sledge.

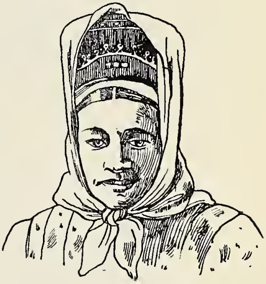


Finland. A typical scene of gently flowing surfaces with ragged lakes, myriads of islands and coniferous forest. Rowing boats, motor launches and lake steamers are the chief means of travel. Compare this picture with that of the Canadian Shield on page 262.

electricity for the timber trade in which half the workers are employed. Forests cover much of the south, and after the spring thaw the rivers are full of the logs that are floated down to the mills and paper factories on the coast. The products are shipped from many small ports, but the foodstuffs, textiles and machinery which they help to buy come chiefly to Helsinki, the capital.

The Finns came originally from Asia, but they owe their European civilisation to the Swedes, many of whom settled along the coast, and, like their teachers, they are a highly educated people. The north of the country, which is mossy tundra, is part of the region through which the Lapps roam with their reindeer, between the White Sea and the Atlantic.

They move where their herds lead them over the bleak marshes and mountains regardless of frontiers. They hunt and trap and fish like the Eskimo, but in Sweden they have settled as farmers in the southern and more fertile part of their range.



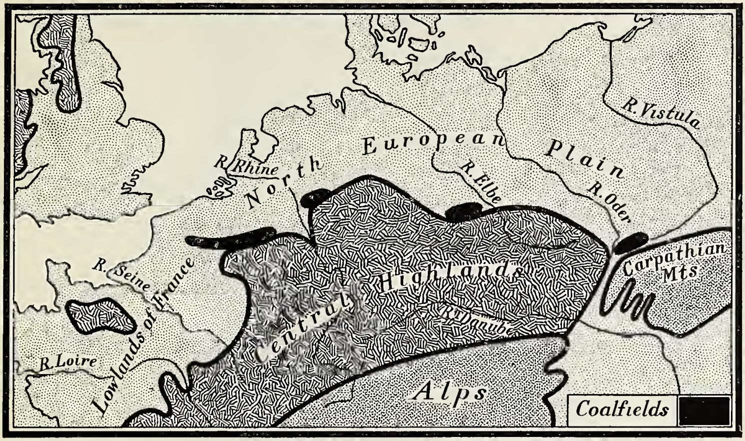
A Finnish Woman.

The Beffroi or Belfry at Bruges, noted for its peal of bells. A belfry is usually part of a church tower or steeple, but some of the older belfries were separate buildings.

CHAPTER 13

BELGIUM AND FRANCE

ALL round from the Bay of Biscay to the Baltic the continent of Europe rises like a broad pedestal to the ranges of the Alps. It is a pedestal of two steps. The first is a wide coastal

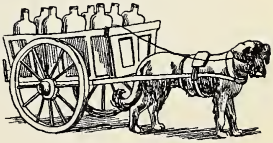

R. Vistula
North European Plain
R. Rhine
R. Elbe
R. Oder
Carpathian Mts
R. Seine
Central Highlands
R. Danube
Lowlands of France
R. Loire
Alps
Coalfields

Surface Divisions of Central and Western Europe. (*a*) a crescent of lowland. (*b*) The Central Highlands, 2,000 to 5,000 feet. (*c*) The southern alpine chains over 10,000 feet: Mt. Blanc, the highest point, is over 15,000 feet. The chief coalfields along the northern foot of the Central Highlands are marked.

plain extending from the Pyrenees to Russia. The second step is formed by the smooth-topped Central Highlands much broken by broad river valleys.

The best soils and the chief coalfields lie at the junction of these steps. Prosperous farms and market towns and great manufacturing cities mark the edge of the Central Highlands; and the rivers, flowing north or west, make the passage easy from one step to the next.

The narrowest part of the plain lies in Belgium. It is her misfortune; for armies, like football teams, prefer to meet on level ground. So this hundred-mile-wide passage between East and West has seen much fighting. Ramillies, Waterloo and Ypres were battlefields in different centuries, and there were many more.

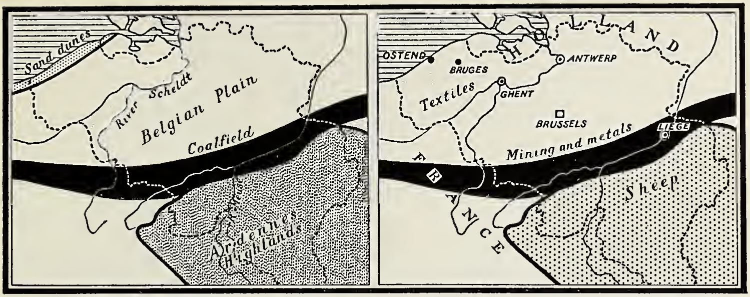


Belgian Dog-drawn Milk Cart.

Lace-maker in Bruges. The delicate pattern of the handmade lace requires great skill and patience.

But farmers also like flat land, and the hard-working Belgian peasants and their wives raise rye and flax or wheat and sugar-beet in every corner of this fertile plain. Along the sandhills of the coast, Ostend and other resorts attract the pleasure-seekers of Europe.

In earlier days this region led the world in wool and linen weaving. The wealth so gained was spent on splendid churches and bell towers and the fine mansions which still adorn cities such as Ghent and Bruges. Cotton goods and artificial silk are commoner today, but the old tradition of beautiful workmanship is still kept up by many a lacemaker at her cottage-door. Otherwise industry has moved to the coalfield at the foot of the Ardennes, where Liége is a great engineering town. The


Sand dunes
River Scheldt
Belgian Plain
Coalfield
Ardennes Highlands
OSTEND
BRUGES
ANTWERP
GHENT
BRUSSELS
LIEGE
HOLLAND
FRANCE
Textiles
Mining and metals
Sheep

Surface Divisions of Belgium. On the left-hand map notice (*a*) Coastal sand-dunes. (*b*) The Plain. (*c*) Coal belt. (*d*) Ardennes Highlands.

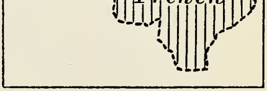
Industries and Towns of Belgium. On the right-hand map notice (*a*) Coastal seaside resorts. (*b*) Farming and textiles on the Plain. (*c*) Mining and metal manufactures on the coal belt. (*d*) Sheep farming on the Ardennes.

Ardennes themselves are a sheep country with thick forests in the valleys.

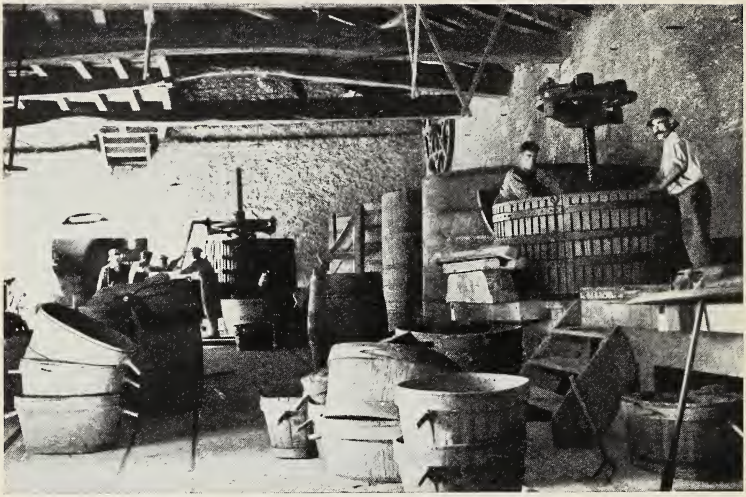
Antwerp on the River Scheldt is Belgium's chief port. It provides a western outlet for German goods as well. Brussels, the capital, stands in the middle of the plain holding the balance between two peoples and languages. For, small as she is, Belgium is inhabited by two races, the solid, serious Flemish of the north and the livelier French-speaking people of the south.

Belgium, which is only the size of Wales, reaches the second step of our pedestal, but France, which is nearly twice as big as the British Isles, reaches the Alps themselves. A block of highlands divides Mediterranean France, where the olive grows, from Atlantic France, whose crops are more like our own.

Mediterranean France is the valley of the Lower Rhône and the coastlands round its delta. It is a country of grapes and olives, of terraced gardens and irrigated fields, where early vegetables, fruit and flowers are grown for northern markets.


Flemish
BRUSSELS
French

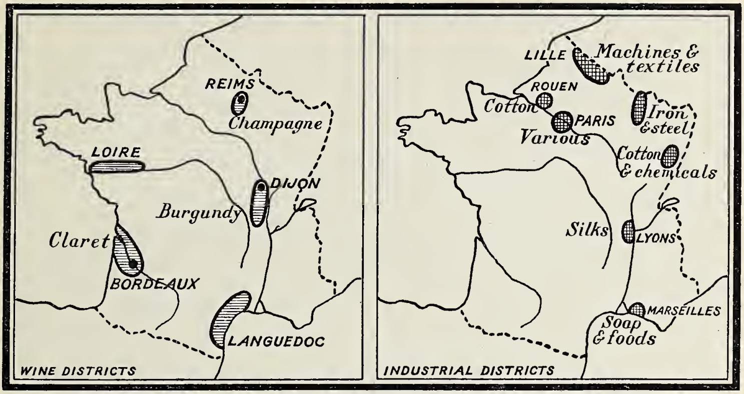
The Languages and Races of Belgium.



Wine-making. The juice is squeezed from the grapes in presses and then, after undergoing treatment, is stored in casks and bottles. What do the men seem to be doing? What are the tubs for?

The southern coast is a string of sunny winter resorts such as Nice and Monte Carlo. The silkworms reared on the mulberries of the Rhône Valley used to provide the cocoons for the silk-mills of Lyons, but now more raw silk comes from abroad. Marseilles, just east of the delta and clear of its sands, is France's chief port for her African and Eastern colonies.

North and west of the highland block the sun is still bright, though not so fierce as on the Mediterranean side, but rain from the Atlantic is more frequent. The north-west, indeed, is distinctly wet, and Brittany and Normandy are regions of cattle, dairies and cider apples. Further south the sun will ripen maize and tobacco. But the two chief harvests of France are wheat and grapes, for white bread and wine are found on

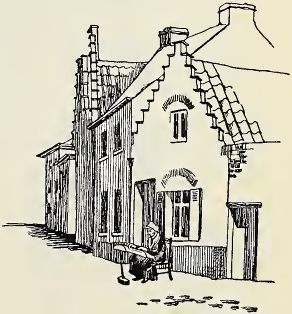

REIMS
Champagne
LOIRE
DIJON
Burgundy
Claret
BORDEAUX
LANGUEDOC
WINE DISTRICTS
LILLE
Machines & textiles
ROUEN
Cotton
PARIS
Various
Iron & steel
Cotton & chemicals
Silks
LYONS
MARSEILLES
Soap & foods
INDUSTRIAL DISTRICTS

Some of the chief products of France.

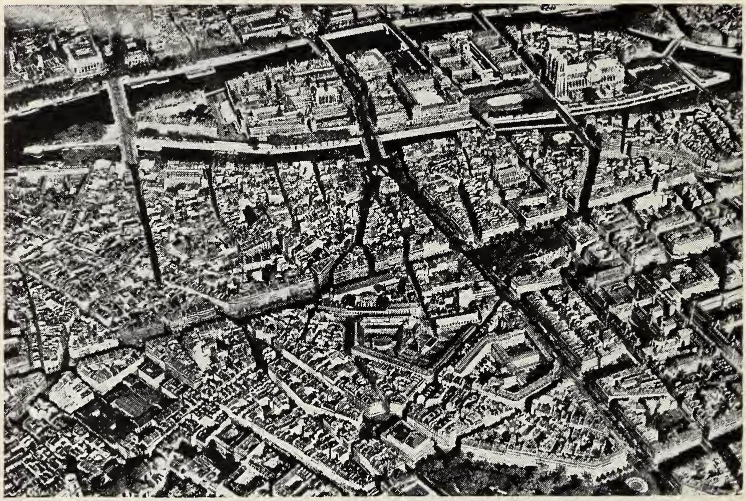
every table. Round Bordeaux and on the sunny slopes further north, in Burgundy and Champagne, there are many vineyards famous for their wines, white or red.

The French farmer uses every yard of soil that is not covered with forest. Except in the north-west, little is spared for pasture and still less for hedges; cows must live indoors or feed by the roadside; hedges waste good soil. Even the trees are lopped of their lower branches to allow the sun to reach the crops and to supply the farmer with fire-wood.

Twenty-five acres is reckoned a fair-sized farm, but two acres will make a vineyard, for vines need much attention and the crop is very valuable. The land is usually the farmer's own, and he loves it. He and his family toil hard to win a living from it. Far more women work in the fields and many more manage their own farms than in this country. All Frenchwomen are careful housekeepers, which is the secret of their success.



" Step-Gabled " House. See also picture, p. 354.

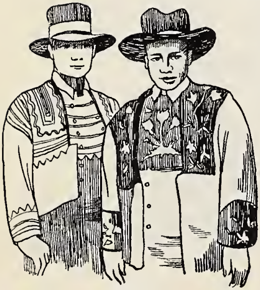


Paris, showing the island in the Seine (Ile de la Cité), which made bridging easy. Round this island the city grew.

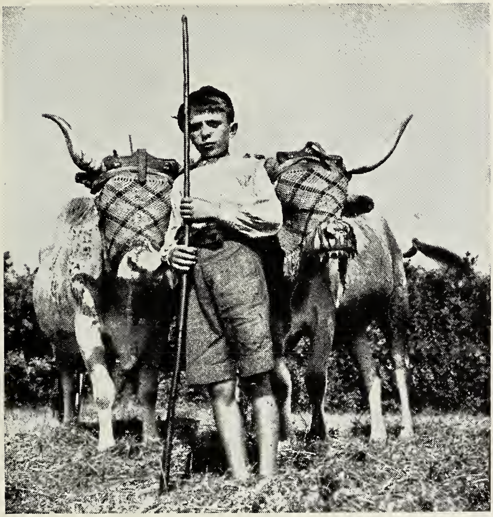
The French excel in small manufactures needing cleverness and good taste, such as toys, jewellery and the ever-changing articles of fashion. These are centred in Paris, the capital.

The city grew up in the middle of the Paris Basin where the Seine and many tributaries meet; its heart is an island which made the Seine easy to bridge.

Textile and metal industries are more widely scattered in France than in most countries. There are cotton mills round Rouen on the navigable Seine and also far inland in Alsace. Lorraine has the largest iron-field in Europe. But only in the north, where the Belgian coalfield extends into France, is there anything like the English " Black Country." Lille is



Breton Peasants.



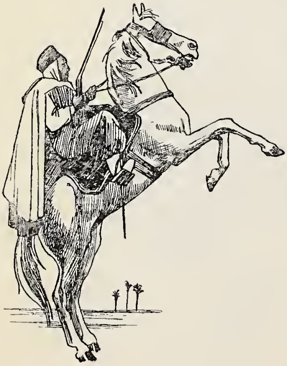
A Basque Boy and his Oxen. The Basques live round the west end of the Pyrenees in France and Spain. This boy is the son of a French Basque peasant. Cattle are much used for pulling carts and ploughs. These are clearly strong beasts (contrast the Indian plough-oxen in Book I.). What are the nets and the pointed goad for ?

the centre of it. Everything is made there from motor-cars to woollen goods and sugar.

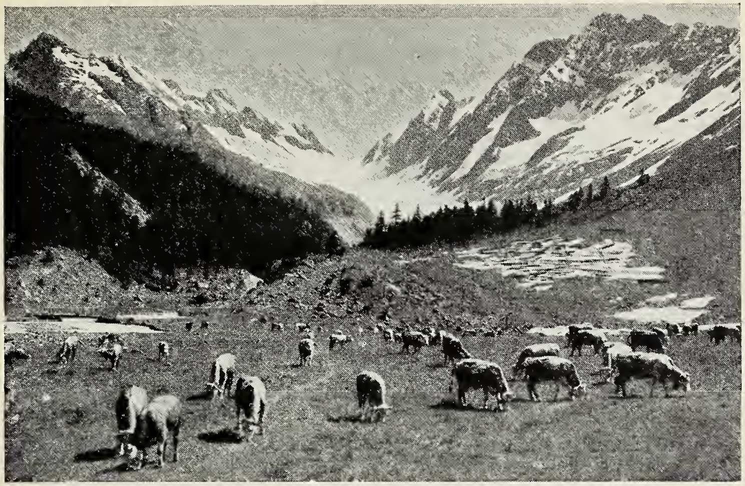
France's coastline faces two seas, so that her navy must be based on two separate ports, Toulon on the Mediterranean and Brest on the Atlantic. On the English Channel, Dunkirk is the port of the northern coalfield, Havre at the mouth of the Seine is the doorway of the Paris Basin and, like Calais, a port for English passengers. Nantes on the Loire builds ships, and Bordeaux on the Garonne exports wine. But France is first and foremost a farming country, capable (as we are not) of growing all her own food. It is her business to see that neither the farmers nor the traders and manufacturers get the upper hand, and she does it most successfully.

France has always been a great colonial power, like Britain and Holland. In former days, as we have seen in an earlier chapter, she explored and colonised Eastern Canada along the banks of the St. Lawrence; and there are in Quebec Province today three million French-speaking inhabitants, living under Canadian rule.

Her present empire includes three great divisions in North Africa, Tropical Africa, and Indo-China. The Frenchman, as a rule, loves his native soil too much to leave his homeland easily. But in North Africa, especially Algeria, the climate is like that of Mediterranean France, and something over half a million French are settled there, growing wheat, vines, olives and other crops familiar to them. In Tropical Africa and Indo-China the climate is too unhealthy for white settlement. The few Frenchmen are only traders, soldiers and Government officials, like the British in India. With native labour they grow rice or rubber or other tropical products for export to France, but large areas, especially in Africa, are hardly developed at all.



Spahi Horseman from French Colonial Army.



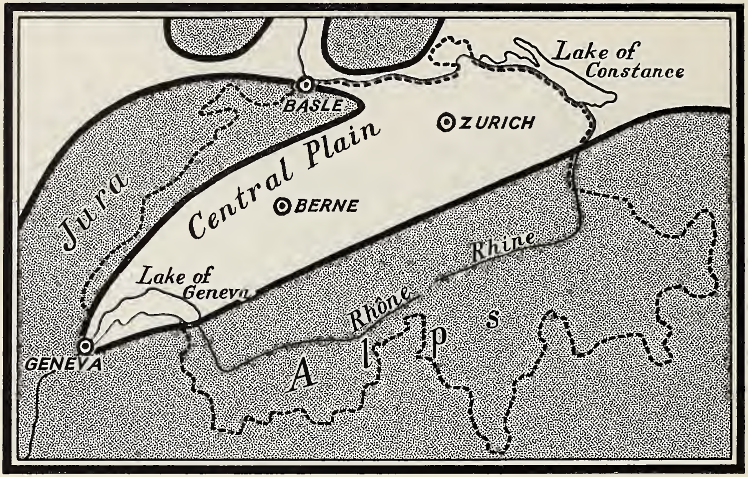
Switzerland. Dairy cattle on a high pasture in summer. The scene is near the upper limit, beyond which trees cannot grow. In the background are jagged peaks, a glacier and its stream, the hummock of the moraine where the glacier formerly ended.

CHAPTER 14

THE LANDS OF THE RHINE

SWITZERLAND is often called the "Playground of Europe." The "Workshop of Central Europe" would be a truer description. But Switzerland has a better claim to fame as the "Land of Freedom." She has shown how her three populations, whether they speak German, French or Italian, can live together as a single nation. And because Switzerland never joins in other nations' quarrels and is in the middle of Europe, the League of Nations has found a home in Geneva.

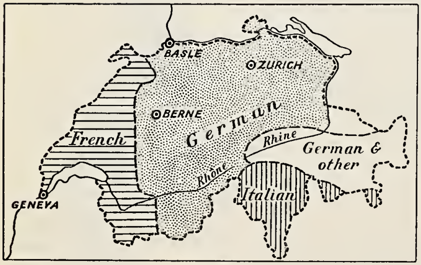
Swiss Bell-Cow.


Lake of Constance
BASLE
ZURICH
Central Plain
Jura
BERNE
Rhine
Lake of Geneva
Rhône
Alps
GENEVA

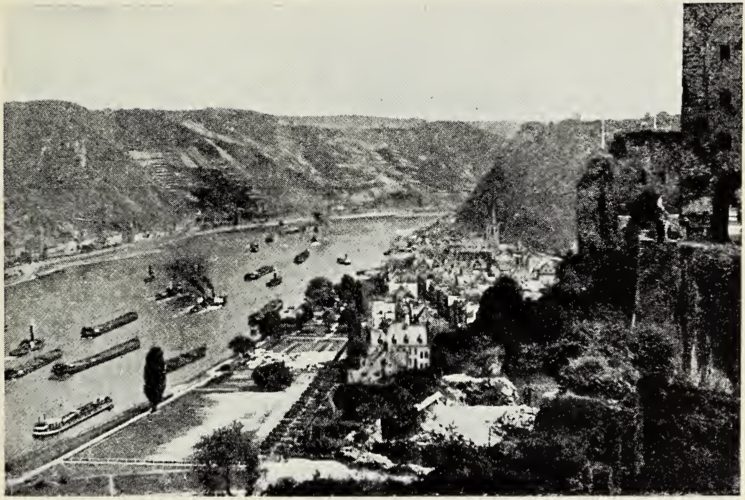
The Three Surface Divisions of Switzerland. (*a*) the Alps with dairy farms and pleasure resorts, (*b*) the Central Plain with farms and factories for textiles and engineering, (*c*) the Jura with cattle farms and clock factories.

The central plain is the heart of Switzerland. It contains Berne, the capital, and the chief farms and factories. Railways enter the country at Basle and Geneva or through tunnels in the Alps and Jura. By these come the raw materials for the cottons and silks of Zurich, the toys and jewellery of Geneva and the watch and clockmaking of the Jura. Such light or valuable articles can bear the high cost of transport by land to outside markets. Only in Britain and Belgium is a larger share of the population employed in industry.

Even the mountains, which form the largest part of Switzerland, have their uses. Mountain streams supply cheap electricity, and Swiss industrial towns are far cleaner than those on coalfields.


BASLE
ZURICH
BERNE
German
French
Rhine
German & other
Rhône
Italian
GENEVA

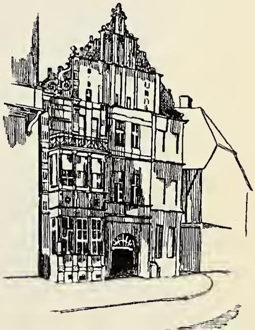
The Languages of Switzerland.



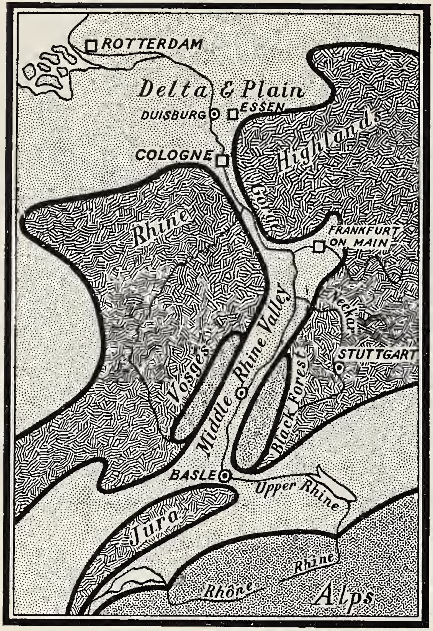
The Rhine Gorge. The walls are high and steep and a castle crowns a crag in the right foreground. There is a little room below for roads and railways. The small town stands on a level patch where a side valley joins. Tugs are drawing strings of huge barges, the living quarters on which can be seen at the stern. In places the steep valley sides are terraced for vineyards.

Where crops cannot flourish, cattle may still find a living.

In May, as the snow melts, the cows are taken up to grassy mountain terraces, called "alps." The herd is led by the bell-cow, decked with ribbons and flowers. Behind follows the rest of the herd with smaller bells and milking stools tied to their horns. At the rear comes the herdsman and his pack pony, carrying bedding and dairy gear to the summer quarters. In autumn, stage by stage, they descend again to the valley villages and winter stalls.



THE RATCATCHER'S HOUSE, HAMLIN, IN GERMANY.


ROTTERDAM
Delta & Plain
DUISBURG
ESSEN
COLOGNE
Rhine
Highlands
Gorge
FRANKFURT ON MAIN
Neckar
STUTTGART
Vosges
Middle Rhine Valley
Black Forest
BASLE
Upper Rhine
Jura
Rhine
Rhône
Alps

The Four Stretches of the Rhine—Upper or mountain course in Switzerland, the middle Rhine Valley, the Gorge, and the Plain and Delta mostly in Holland.

The Swiss are also hotel-keepers. Much money is brought to the country by foreigners who come to enjoy winter sports or the summer beauty of lake and mountain.

From a glacier in Switzerland the Rhine is born. As far as the Lake of Constance it is a rapid Alpine river. Slowed down and filtered of its mud by the waters of the lake, the Upper Rhine reaches Basle. Here it turns northwards between France and Germany following a broad valley, 20 miles wide, between the Vosges and the Black Forest. At Strasbourg the river becomes navigable, and strings of barges drawn by tugs bring coal and other heavy cargoes from the north. The valley is marshy and seamed with deserted channels. Most of its old villages and towns, therefore, line the foot of the bordering hills.

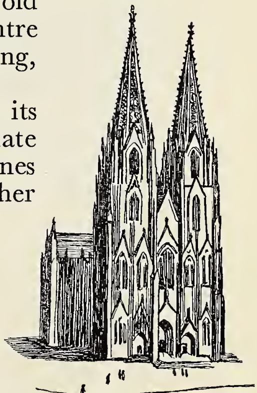
The Neckar and the Main enter this valley towards its northern end. The district seems packed with towns. These

Duisburg is the greatest river-port not only in Germany but in the world. It stands where the River Ruhr joins the Rhine. The town has close behind it the greatest of German manufacturing districts. Of this Essen is often named as the centre, but it is really an almost continuous mass of houses and factories for fifty miles.

The traffic of the port consists chiefly of heavy things, much of it carried by barges; the one seen near the bottom of the picture suggests their huge size. Outwards the port sends much coal through Holland and upstream to towns along the banks of the Rhine. Inwards it imports iron ore which comes from overseas—Sweden, for instance—as well as from Lorraine. It also imports a great deal of grain and petroleum.

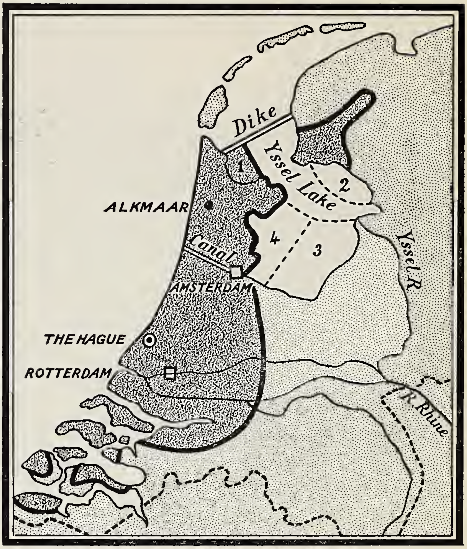
belonged to separate states before Germany became united. Frankfurt-on-Main, for instance, is an old picturesque city, once a capital and great centre of banking. Today its chief industry is engineering, for which it imports coal and iron up the river.

The Rhine now enters a gorge famous for its scenery, its castles and its legends. Its climate and people and not least, perhaps, its wines have always attracted the Germans of other



Cologne Cathedral.

Dutchmen on the Quayside.



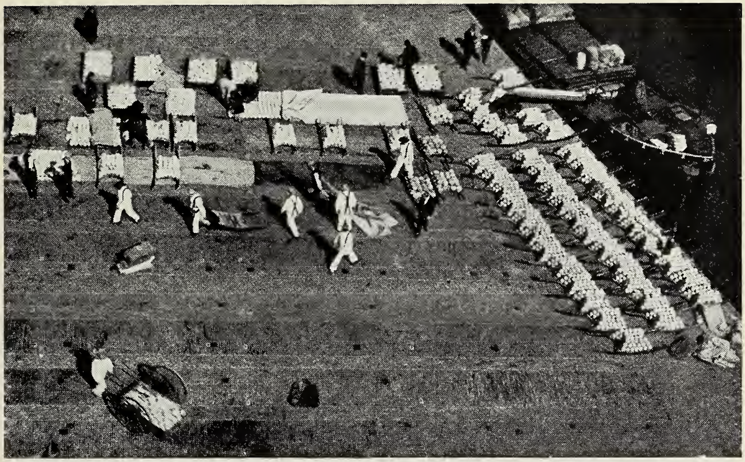
Holland. The name means hollow or low country; the Dutch call it Netherlands which means the same. The land below sea-level is shaded and the plan for reclaiming the Zuyder Zee for four polders is shown—1 (completed), 2, 3 and 4.

regions. An old German student song even warns young men against its temptations:

> " To the Rhine, to the Rhine, never go to the Rhine !
> Take warning, my lad, and be wise;
> For hearts are too free where all pleasures combine,
> And life wears too merry a guise."

But industry is destroying the river's most picturesque reaches. Trains on either bank wake the echoes of the towering cliffs; quarries and cement works deface them, and tugs trail strings of heavy barges past the haunts of dragons and water nymphs.

At Cologne the Rhine enters the plain as a sluggish and uninteresting river. The country becomes thoroughly industrial. A coalfield with its blast-furnaces and steel works extends 50

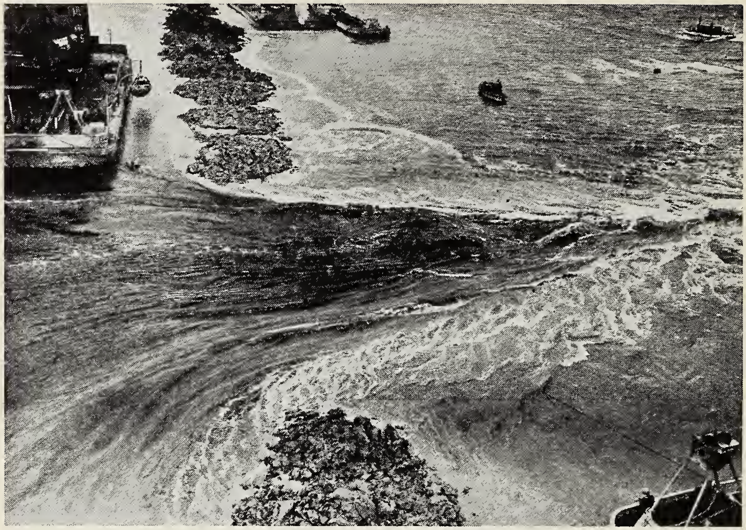


Cheese Market at Alkmaar in North Holland (map, p. 366). The round cheeses are seen in this air view to be laid out on large crates, dragged on sledges and rolled down troughs into waiting barges. They are yellow in colour, but they are coated with a red wax for export.

miles eastward. Essen is the heart of the heavy engineering; Cologne is the business centre; and Duisburg is the largest river-port in the world. (See picture on p. 365.) Thereafter the Rhine divides into the several branches of its delta in Holland.

Holland, though a small country, was a powerful one three centuries ago, and still has a colonial empire in the East Indies. One of the most peaceful nations of Europe, the Dutch are still a great trading people. Amsterdam, a city of canals, is connected directly with the North Sea. It trades in sugar, coffee and other products of Holland's eastern possessions. Rotterdam is a gateway for the German manufacturing region round Essen and Cologne as well as for Dutch products.

For all her trading, Holland is mainly a country of peasants



The Reclamation of the Zuyder Zee. The picture shows the rush of water as the tide goes out through the last opening before the dyke was closed.

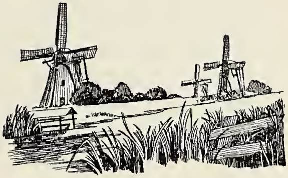
who own, as in France, their little farms. By hard work and scientific methods these small-holders have changed poor soils into tulip fields and dairy farms famous for their cheeses. Denmark itself has hardly done more.

Much of the country lies below the level of the sea and the rivers. If the dykes were removed, at least a quarter would be flooded. These lowlands, crossed by many drains and ditches, are called polders. Windmills and steam pumps lift the water from the drains into the rivers, and careful watch is kept on the dykes.

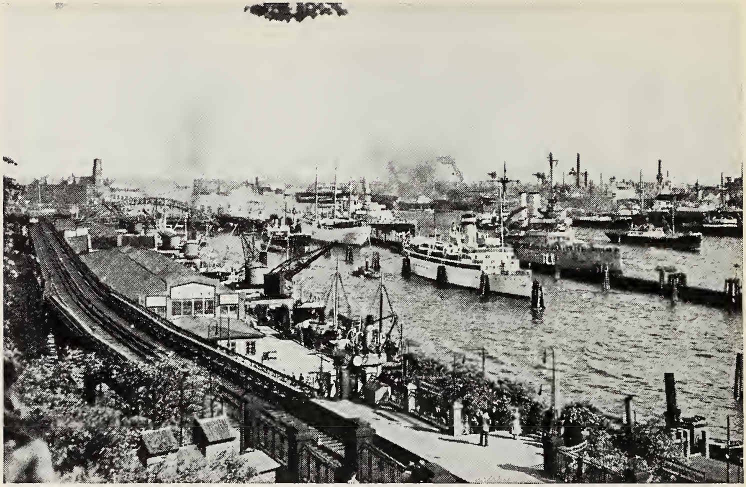
For centuries the Dutch have been recovering land from the sea. The latest and greatest plan is to drain the Zuyder Zee

(Southern Sea). First they built a dyke, 20 miles long, across the entrance to keep out the sea. Stiff clay, dredged from the shallow bottom, was dropped in position and the bank strengthened with brushwood and a facing of stone. The picture on p. 187 shows how the banks of the Great Ouse in the Fens are strengthened in the same way. The next step is to enclose parts round the inside and pump out the water. The centre must be left as a lake to take the water of the rivers until at low tide it can escape through sluice gates into the sea. In time the lake will lose its saltness and then it will serve for irrigation in dry summers.

One new polder on the north-west has been completed. But it will be several years before the salt in the soil drains away and full harvests are obtained. When the whole scheme is finished, the new land is expected to hold nearly half a million people.



Windmills in Holland.

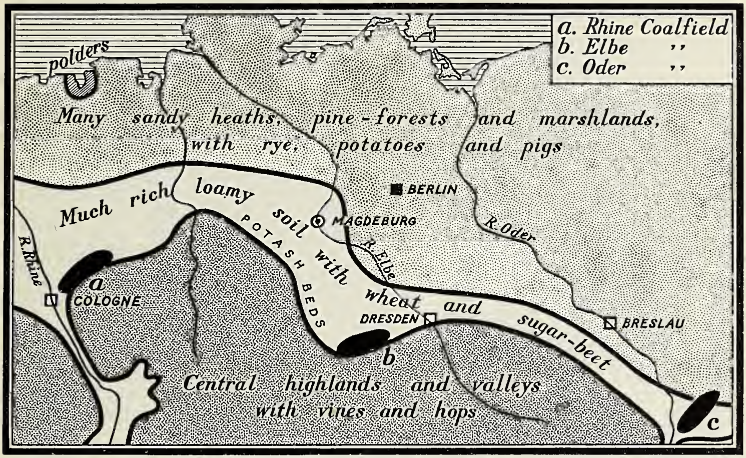


Hamburg. This view should be compared with that of Duisburg on page 365. The liners and tramp steamers here seem as many as the barges of the latter; battleships are also visible. The quays are well equipped with electric cranes, warehouses, and railway lines. Since the rise and fall of the tide is small, there is little need for basins and lock-gates. (Contrast Liverpool, page 467.)

CHAPTER 15

EAST OF THE RHINE

LIKE France, Germany reaches from the sea to the Alps. It includes, therefore, a northern plain, central highlands and Alpine valleys. Two great rivers flow north across the plain to different seas. The Elbe leads to the ice-free North Sea; its port of Hamburg trades with all the world. The Oder enters the Baltic, and its mouth is frozen for several weeks


a. Rhine Coalfield
b. Elbe ,,
c. Oder ,,
polders
Many sandy heaths, pine-forests and marshlands, with rye, potatoes and pigs
BERLIN
Much rich loamy soil with wheat and sugar-beet
POTASH BEDS
MAGDEBURG
R. Oder
R. Elbe
R. Rhine
a
COLOGNE
DRESDEN
BRESLAU
b
c
Central highlands and valleys with vines and hops

Soils and Products of Germany and Poland. The black patches are coalfields.

in winter; Stettin at its mouth trades mainly with Baltic countries.

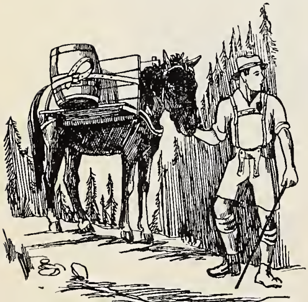
Germany and France are equal in area, but France has only 42 million inhabitants, while Germany has 72 millions. Germany, far more than France, needs foreign food and raw materials, which she pays for in manufactured goods. Her western ports, therefore, are very busy, and Hamburg busiest of all.

The northern plain is full of little lakes filling the hollows left by the ancient ice sheet (see map, p. 337). The soils are chiefly poor sands and clays due to the same cause, and the sands are covered with pine forests or dreary wastes only beautiful when the heather is in flower. But the Germans are hard-working and, with the help of science, grow great quantities of rye and potatoes and breed many pigs in this unpromising region.

Nuremberg. This is an old city and still has walls, moat, picturesque buildings and narrow streets dating from the Middle Ages.

Berlin, the capital, with $4\frac{1}{2}$ million inhabitants, lies in the middle of this plain in the old kingdom of Prussia. Berlin, as a city, is not old, and its finest buildings house the various branches of the Government. It is surrounded by forests and lakes, which are beautiful in summer.

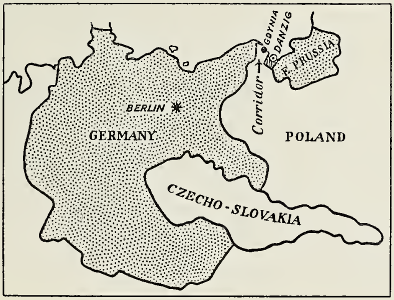
Better soils are found near the Central Highlands. Villages and market towns lie thickly there, as well as manufacturing cities, for there are coalfields and saltbeds for chemical industries. Magdeburg on the middle Elbe makes sugar from the local beet. Leipsic, further south, is the centre of Germany's book trade. Dresden, on the Elbe where it leaves the Highlands, is famous for its china, and is called the "German Florence." As the capital of the



PONY TRANSPORT IN THE BAVARIAN ALPS.

former kingdom of Saxony, it became a leader of German art and music.

The valleys of the Central Highlands are warmer and grow hops, tobacco and even vines. The farmers are small-holders, not the owners of large estates as so often in the north and east. Many southern towns owe the wealth that made them beautiful, and their skill in handicrafts to trade with Italian cities beyond the Alps. Nuremberg, famous for its toys, is one of these. Modern factories now lie round it but do not destroy the old-world charm of its central streets. Munich, like Dresden, owes its renown for arts and music to royal patronage, for it was the capital of the Kings of Bavaria. But its light " lager " beers are its most popular product.



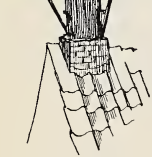
Germany (dotted), showing East Prussia cut off by the Polish Corridor.

The Alpine pastures, forests and ironfields of Austria are now part of Greater Germany. A single nation, speaking the same language (though not always thinking the same thoughts), now covers the whole basin of the Upper Danube—the " Blue Danube " of the well-known waltz tune—down to Vienna and beyond. That city, till recently the Austrian capital, is the central junction of European railways and a place noted for its scientists and doctors.

A Scene in Poland. Harvesting is here carried on by hand.

Eastern Europe has changed greatly since the War. Five new countries have been created from the land of others. Three little states now fringe the eastern Baltic: Esthonia, Latvia and Lithuania—all carved from Russia. Poland, an ancient kingdom divided among its enemies, has been reunited from the Baltic to the Carpathians. Across the plain the River Vistula swings in two great bends. It is used by barges carrying timber, grain and coal whenever it is not frozen. In the spring thaw it overflows, but Warsaw, the capital, is built on a high bank above the floods.

The coalfield of the Upper Oder is the second largest in Europe, and a great metal industry flourishes along the foot of the Carpathians. Round Warsaw the weaving of

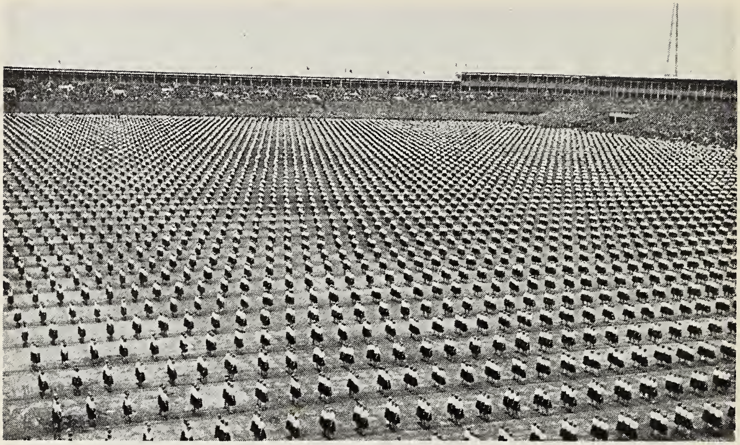


Storks on house-tops bring good luck to a village.

The Mazurka, a Polish peasant dance. Every country has its folk lore and folk dances, and they differ widely. Poland is particularly rich in them. The best known dance is the mazurka, which has gained world fame through Chopin's music. The dancers are elaborately dressed, the men in breeches and top boots and the women in bright colours and embroidered bodices and skirts.

cotton employs many mills. But Poland is mainly a farming country of small-holders or great estates, with many villages and market towns, whose retail trade is carried on by Jews. The crops vary according to the soil as in Germany, and towns are again most frequent in the more fertile south. The chief of these is Cracow on the Upper Vistula.

But Poland's progress is hampered by her past history. On the West, German and Austrian control spread education and

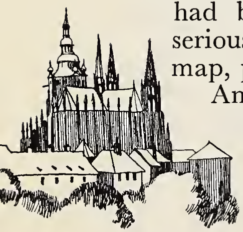


A Sokol Festival at Prague in 1938 where 16,000 women took part in a display of physical exercises. The Sokols form a kind of brotherhood like the Boy Scouts.

scientific methods of farming. There, machinery is used and good crops are grown. But Russian Poland was neglected, for everything was sacrificed to secure a strongly guarded frontier. So in the east, methods are still backward and crops poor.

The new boundaries cause many difficulties, especially with Germany. A narrow tongue of land, the "Polish Corridor," joins Poland to the Baltic, but divides East Prussia from the rest of Germany. Danzig at the mouth of the Vistula would have made an excellent port for Poland, if it had not been a purely German town. Instead, it was made a Free City, as it had been long ago, but that arrangement has caused serious trouble. Poland built a new port of her own (see map, page 373).

Another new state is Czecho-Slovakia, which lies among the Highlands. The Czechs inhabit Bohemia, where

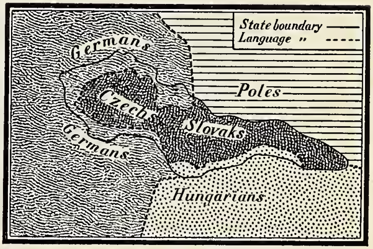


Prague Cathedral.

"good King Wenceslas" once lived. A square is named after him in Prague, the capital. This mountain-fringed plateau is the more advanced end of Czecho-Slovakia, for the Elbe, which rises in it, kept it in close touch with Germany. The coal and iron-fields west of Prague support many thriving industries.

The Slovaks are farmers of the West Carpathian valleys, backward because of former neglect. Both peoples belong, like the Poles, to the Eastern European race called Slavs, whose chief representatives are the Russians. But there are large sections of other peoples among the 15 million inhabitants of the country. "I sell goods in eight languages" said a shopkeeper in one of the towns. There are 3 million Germans in Bohemia and nearly a million Hungarians in Southern Slovakia. It is one of the Government's chief problems to satisfy these "minorities."

At the time of going to press the boundaries of Czecho-Slovakia and its adjacent countries are in the process of change.



THE PEOPLES OF CZECHO-SLOVAKIA.

The Danube at Budapest. Many river boats, tugs and barges are at the quay. Barrels and electric cable drums await shipment. The pilots are of many nationalities. Several bridges connect Buda with Pest; one of them can be seen in the distance.

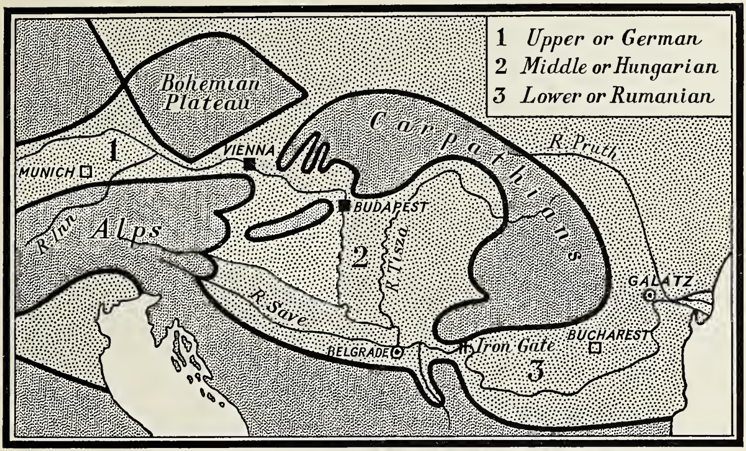
CHAPTER 16

LANDS OF THE DANUBE

THE Danube rises in the Black Forest and flows into the Black Sea. Beside a South German palace a spring bubbles up into a pool, and over it is engraved in German:

SOURCE OF THE DANUBE
2,224 *feet above sea-level.*
1,765 *miles to the sea.*

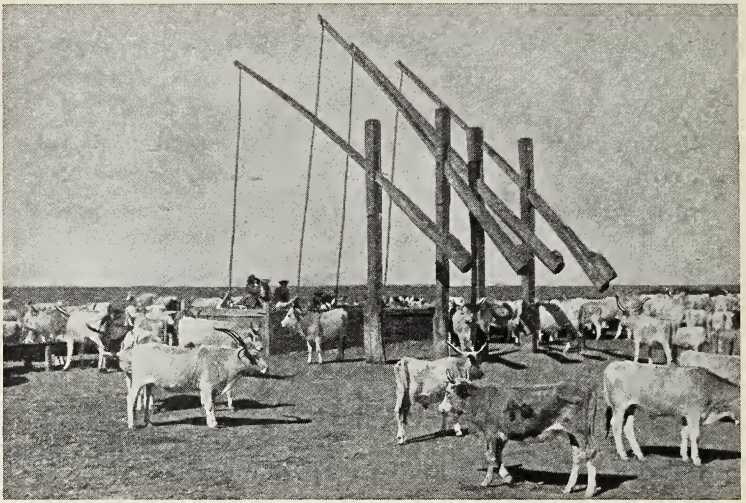
But the river does not fall that distance at a regular 15 inches every mile. It drains three wide basins, and between them it passes in rapids through narrow gorges, once above Vienna and once below Belgrade. Its mouth is too far from Western


1 Upper or German
2 Middle or Hungarian
3 Lower or Rumanian
Bohemian Plateau
Carpathians
R. Pruth
1
MUNICH
VIENNA
BUDAPEST
R. Inn
Alps
2
R. Tisza
R. Save
GALATZ
BUCHAREST
BELGRADE
Iron Gate
3

The Danube. The three basins, connecting gorges and surrounding highlands are shown. The basins are: 1, Upper or German; 2, Middle or Hungarian; 3, Lower or Roumanian. One or two important feeders in each basin are added, as well as a few important cities.

Europe to make the river of much value except to the six countries on its banks. The rapids, moreover, make upstream traffic difficult, so that heavy cargoes, such as grain or timber, are rarely carried beyond the separate basins, and the tugs and river steamers are far less active than on the Rhine. But the Danube valley opens a valuable railway-route to south-eastern Europe.

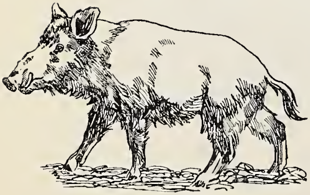
Let us follow the Danube to the sea. In the Upper or German Basin the main stream has been pushed north by the soil washed down by its Alpine tributaries. These torrents increase its current and in spring the Inn particularly brings down heavy blocks of ice. There are shelters along the Danube's banks to protect small steamers from this danger. The scenery of the Upper Danube is finer even than that of the Rhine. We reach



Cattle at a well on the Hungarian Puszta. The " last uncultivated remnant of the Great Danubian Plain " where grey wide-horned cattle, troops of untamed horses, and flocks of sheep roam. The grassy levels extend as far as the eye can see. The hinged beams, weighted at the opposite end, lighten the work of raising the water from the well.

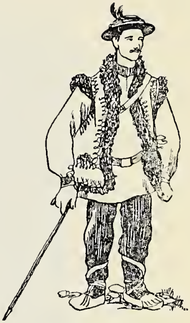
Vienna through many twisting gorges. Every height is crowned by some ruined castle with its legend of the grim, romantic past, for this is the heart of ancient Germany.

Below Vienna with its nine miles of quays we enter the great basin of the Danube's middle course. The river grows broader and slower. It winds between low banks and cultivated fields. Many islands divide its channel, and often it is bordered by wide marshes. Its size is increased by great tributaries from the Eastern Alps and the Carpathians, and long stretches have to be protected by embankments against flooding.



Wild Boar.

For a while the river is the frontier between Czecho-Slovakia and Hungary. Then for a short distance it narrows its bed and quickens its current, as it passes through a gap in a ridge. This ridge divides the Little from the Great Plain of Hungary, and here we may consider ourselves to be entering south-eastern Europe.



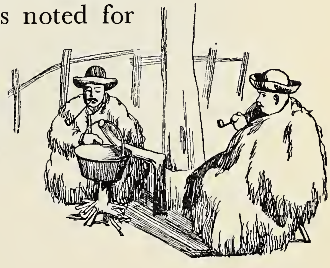
A Carpathian Hunter.

Henceforward, whatever the case elsewhere, farming will be all-important, and industry of little interest. Nature is wilder in the east. Bears, wolves and boars may prove serious dangers in lonely places and winters are very severe. Mountains and eastward-flowing rivers make it hard to reach the west and north, where Europe's civilisation is most advanced.

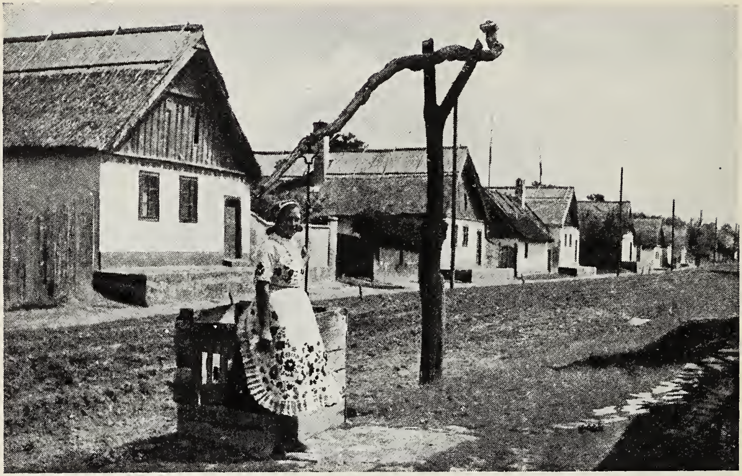
The plain of Hungary is very fertile. Its twin capital, Buda on the west and Pest on the east bank of the Danube, makes a fine city. The Hungarians are justly proud of it, but they have put all their goods in that window. All business is done in Budapest; the other towns are merely overgrown villages.

East of the city stretch the "pusztas," wide grassy plains like the American prairies or the Russian steppes of the next chapter. Mounted cowboys tend the herds of grey wide-horned cattle and half-wild horses, and the shepherds wear heavy sheep-skin coats to keep out the icy winter winds. Nothing but a clump of trees round a lonely farm, the tall poles of scattered wells, or here and there a village, breaks the monotony of the landscape. Further south, where the soil is clay, the plain becomes in summer a sea of wheat. Hungary is as noted for its excellent flour as for its love of horses and horse-racing.

The Hungarians originally came as mounted invaders from the Steppes of Asia. They have long been completely Euro-



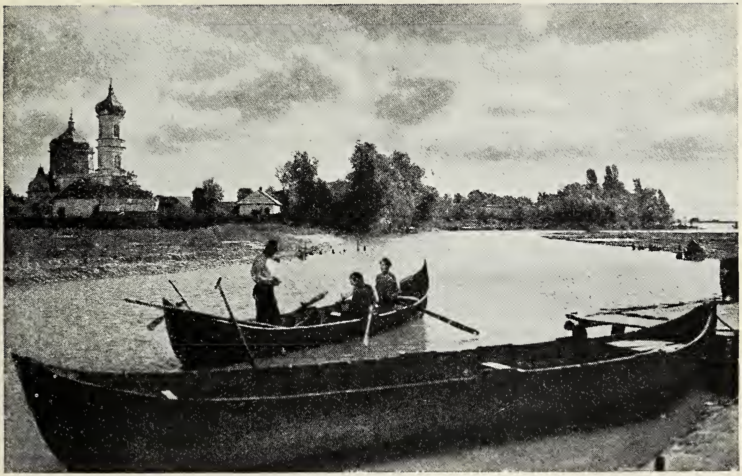
Puszta Shepherds in Sheep-skin Coats.



A Village on the Hungarian Plain. The houses are mud-walled and white-washed in the absence of stone or timber. The thatch is of reeds held down by wooden slats. Unlike villages in England, the cottages stand " end-on " to the street and the doors are raised above the snow of winter, slush of spring, and dust of summer on the unpaved road. The girl with elaborately worked cap, dress and apron is at the village well. The telegraph and wireless evidently reach here.

peanised, but they speak a language as different from that of their Slav neighbours as from those of Western Europe.

The Danube now enters Yugo-Slavia, which means the country of the Southern Slavs. The Yugo-Slavs hold 350 miles of the Adriatic coast, whose dangerous waters make them the best sailors of the Mediterranean. But that coast is cut off by mountains from the interior, and the country's interests are centred rather in its upland valleys and the Danube plain. The people are mainly either foresters or farmers. The capital is Belgrade, a hill-city near the junction of the River Save with



The Danube Delta and Rumanian Village. The land is low, flat and marshy, the stream is bank high, and there are poplar and willow trees. A boat is the simplest means of travel on the many creeks, and there is much fishing.

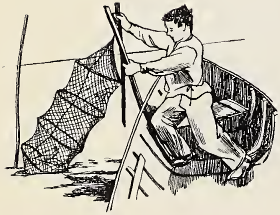
the Danube. Belgrade is the gateway to the Balkan Peninsula as well as to the gorges of the Carpathians.

As it swirls through these gorges leading to the Iron Gate, the Danube divides Yugo-Slavia from Rumania. The Iron Gate is not a gorge, but open rapids across a ledge of granite. Beside them a channel has been blasted out of the rock, but even here a riverside railway engine must help a tug up-stream. Below the rapids the current again becomes sluggish. For a while it separates the lagoons and marshes that fringe the Rumanian steppes from the plateau of Bulgaria. At last, now wholly Rumanian, the Danube turns north and east to build its three-mouthed delta out into the Black Sea.

Rumania's area was doubled at the end of the European

War. It has rich wheat and maize lands on the plains, valuable oil-fields and forests among the mountains. Danube river traffic meets ocean vessels at Galatz, though ships are liable to be trapped there by early winter ice. Bucharest is a capital on the model of Paris, for French influence is strong. To avoid the marshes it lies far from the river.

The route of the " Orient Express " from Paris to Constantinople follows the Danube Basin through Munich, Vienna and Budapest. But at Belgrade it enters a long furrow of river valleys leading through the mountains of the Balkan Peninsula to Sofia, the capital of Bulgaria. Thence the railway reaches Constantinople, or Istanbul, in the last remnant of Turkish territory in Europe. This great city, the former capital of Turkey, is now chiefly important because it controls the outlet of the Black Sea. But in history it is nearly as famous as Rome itself, whose place it took for many centuries as the capital of the Roman Empire.



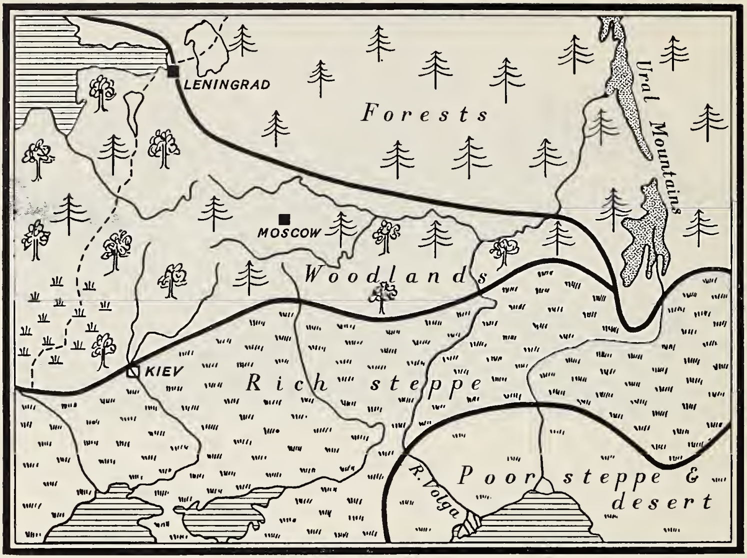
A Fisherman of the Danube Delta with Cylindrical Net.

Moscow. The heart of the city is the Kremlin, the fortified city of palaces and churches; notice the old eastern style of architecture with its onion-shaped domes. Outside, the city has been expanding rapidly with modern concrete buildings, like those of Central Europe. The river is the Moskva, and the city is joined to the Volga by a deep canal.

CHAPTER 17

U.S.S.R.

THE Union of Socialist Soviet Republics (U.S.S.R.), which used to be the Russian Empire, extends from the Baltic to the Pacific and from the North Pole to the Pamirs. The pictures which this vast area presents (even if we exclude the Arctic Ocean) are mainly monotonous. First, an endless forest of pine and fir; next, wide stretches of prairieland, or steppe. Between forest and steppe, but only in Europe, stand mixed woodlands of oak and pine, which disappear as the climate gets drier towards the east. North of the forest a belt of treeless

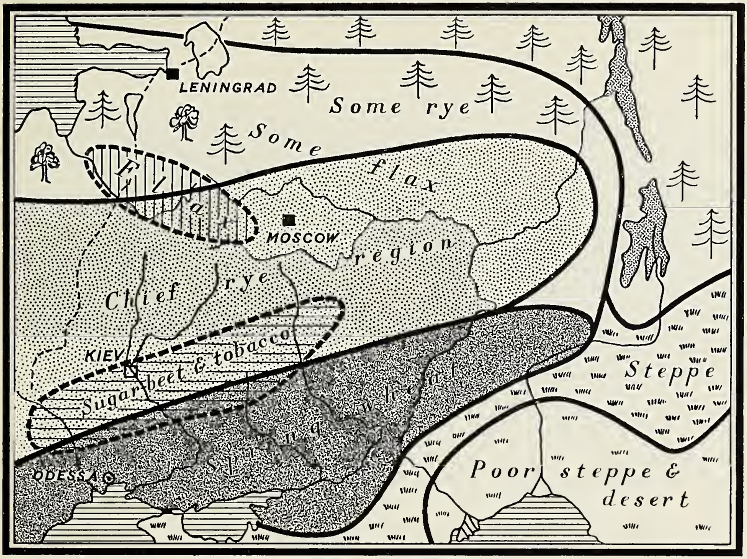

LENINGRAD
Forests
Ural Mountains
MOSCOW
Woodlands
KIEV
Rich steppe
R. Volga
Poor steppe & desert

Belts of Natural Vegetation in European Russia. What are the four belts in order from north to south? Notice that Leningrad and Kiev are on the borders where one belt gradually passes into another; Moscow is in the heart of the woodland belt.

tundra fringes the Arctic Ocean. South of the steppe, and east of the Caspian Sea, lie semi-deserts and wastes of sand.

A population of 170 millions, of many races and languages, means many separate governments; but in matters such as farming, industries or the army, orders are given by a central committee, or Soviet, in Moscow. The old Russian capital is well placed. It lies within this triangle of densest population, whose corners are Leningrad, Odessa and Tobolsk. A network of railways spreading from Moscow covers the triangle. Else-

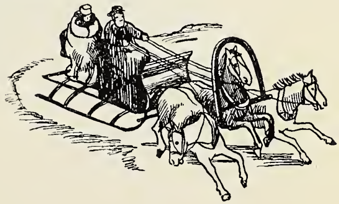
Russian Bear.


LENINGRAD
Some rye
Some flax
Flax
MOSCOW
region
Chief rye
KIEV
Sugar-beet & tobacco
Spring wheat
ODESSA
Steppe
Poor steppe & desert

Cultivation Belts in European Russia. Compare this map with the one of natural vegetation. Rye is hardier than wheat, flax is hardier than tobacco; sugar-beet needs deep fine soils.

where the railways, such as the Trans-Siberian, have few branches, and the highways are mere tracks, on which dogs, reindeer, horses, donkeys, oxen, camels or buffaloes, according to the region, are far commoner than motors.

Over the great plain, which stretches from Poland to the Yenisei River and southwards to the Caucasus Mountains, waterways are plentiful but disappointing. The Volga, the longest river in Europe, runs 2,400 miles to end in the Caspian, an inland sea. Its course is hampered by rapids, sandbanks, drought



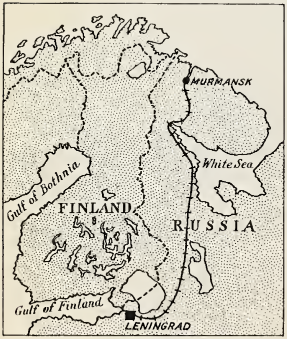
Troika, a three-horse sledge.

Caravan of Oil Tankers at Gorki. They have brought oil from Baku across the Caspian and up the Volga to Gorki (once called Nijni Novgorod) at the junction of the Oka and Volga. The town has giant motor-car and lorry factories. Note the huge width of the river even here. How far from the sea is it?

and ice, but 2,000 miles of it are usable for over half the year. In summer it helps to distribute the oil from the wells of Baku, east of the Caucasus; in winter its surface is used by horse-drawn sledges.

The lack of open ports is serious. Even powerful ice-breakers can hardly keep Leningrad open in winter. Odessa on the Black Sea and Vladivostok in the Far East suffer less from ice, but all three lie on enclosed seas. The only ocean port is Murmansk. The warm Atlantic waters just reach this outpost in the far North. A railway joins it to Leningrad, and trade is possible all the year round.

The great forests supply timber for home or foreign use. Some is floated down the Ob



The Murmansk Railway.

A Collective Farm, the last of the threshing. The rolling plain extends to the horizon. The great stacks of straw are signs of the amount of grain produced. Note the large number of women workers.

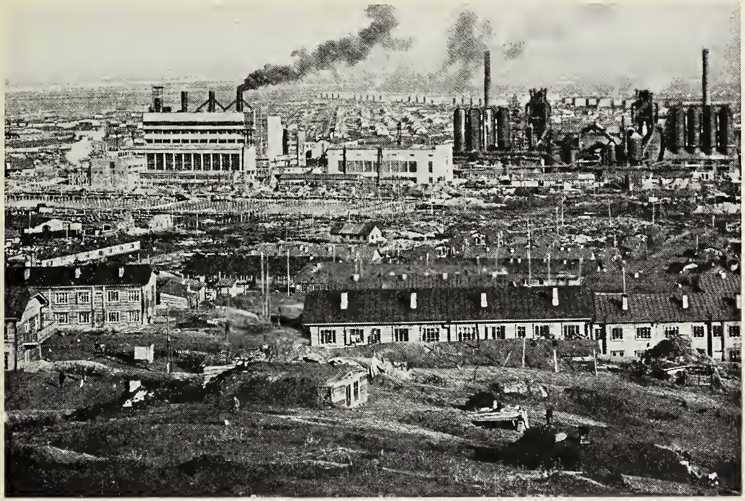
and the Yenisei to the Arctic seaboard, where ice-breakers try to keep a sea-route open, but most is shipped from northern ports in Europe. On the more fertile soils of the woodland region a warmer climate encourages the growth of flax and rye, and even sugar beet and tobacco. But it is the deep " black earth " of the steppes that best repays farming. Excellent wheat is grown, but less reaches the Black Sea ports than formerly, when the Russian peasants could not afford to eat it.

All land now belongs to the Government. The old farms, often too small to yield a living, have been replaced by great " collective " farms worked by groups of men and women. Each family has its own cottage and its own cow, pigs and hens.

Physical exercises in Russia to the accompaniment of an accordion. The scene is on a collective farm in the early morning and shows part of a campaign to improve physical fitness.

Everything else belongs to the group, which elects a committee to carry out the Government's orders for the year. The workers are divided into gangs to do the various jobs, and machinery is hired from the Government. Of the year's crops part is bought by the Government, part is reserved for seed or winter fodder, and the rest is sent to market. The profits are partly divided among the workers and partly spent on supplying hospitals, schools, amusements and other things the Government thinks good for them.

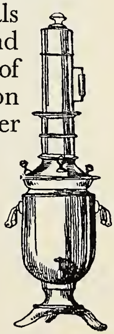
The long Russian winter is followed by the mud and floods of a sudden spring, the thunderstorms of early summer, sometimes by scorching drought. But the autumn frosts drive farmers



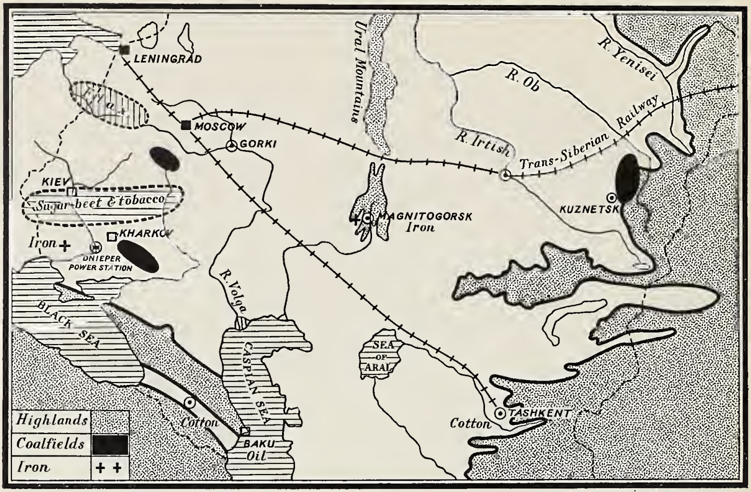
Kuznetsk, in Central Siberia, is one of the "Giants of the Five-Year Plan." The coal-mining and steel town has replaced the empty spaces of a few years ago. Notice the blast-furnaces, the houses of wood and the general new and unfinished appearance.

from their fields and boatmen from the rivers to find work indoors. Many cottage industries flourish in winter. The peasants are clever workers in wood and leather and in making home-spun clothes of linen or wool.

Such a climate makes life difficult, and Russia's progress in the past has been slow. But the Government has also planned the industries of the country. More fuel and raw materials have been produced, thousands of new factories built, and supplied with workers trained to make all kinds of machinery, clothing and other necessities. Coal and iron are very plentiful south of Moscow, and a great power station on the River Dnieper makes electricity.



SAMOVAR, OR RUSSIAN TEA URN.

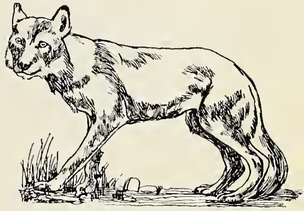

LENINGRAD
Fla
MOSCOW
GORKI
KIEV
Sugar-beet & tobacco
KHARKOV
Iron +
DNIEPER POWER STATION
BLACK SEA
R. Volga
CASPIAN SEA
Cotton
BAKU Oil
Ural Mountains
MAGNITOGORSK Iron
SEA OF ARAL
Cotton
TASHKENT
R. Ob
R. Irtish
Trans-Siberian Railway
R. Yenisei
KUZNETSK
Highlands
Coalfields
Iron + +

Industrial Map of Russia. Three chief coalfields and two ironfields are shown. Besides the flax, sugar-beet and tobacco shown on the preceding map, the chief cotton region in Turkestan is marked. Two important railways—from Siberia (the Trans-Siberian Railway) and from Turkestan—are also shown connecting with Moscow.

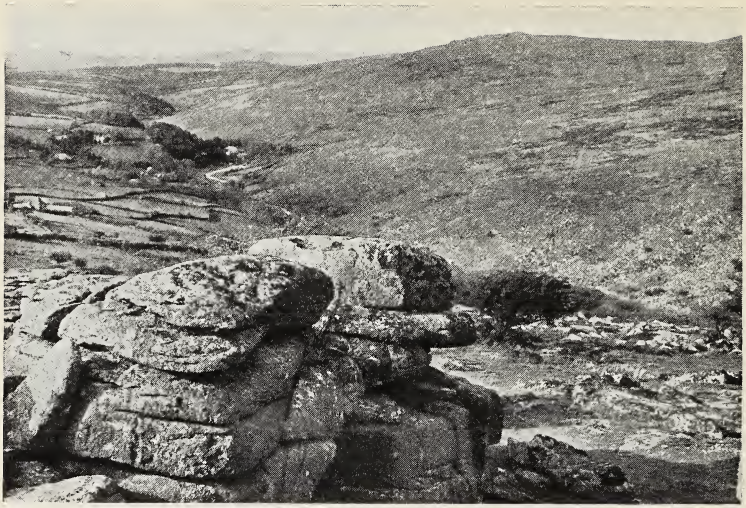
Beyond the low Ural mountains lies Siberia, no barren wilderness only fit for criminals, as was once supposed, but a country very like Canada with much the same advantages and drawbacks. The colonists of the Siberian steppe round Omsk breed cattle and make butter. They could grow as good wheat as the Canadians, if it could reach a market. Unfortunately, the lakes and rivers do not help as the Great Lakes and the St. Lawrence do. But the steel industry has made striking progress. The great Kuznetsk coalfield lies in Central Siberia; rich iron ore is found in the Urals, more than 1,000 miles away. The railway carries the iron east and the coal west, and at both ends great manufacturing towns are springing up.

Beyond the Yenisei the mountains begin. The surface is too rough and the climate too severe for widespread farming, but mining and lumber camps grow every year more numerous. Gold and other metals are found, and timber is cut wherever it can be hauled or floated down to civilisation. The native peoples of Siberia live in much the same way as the Indians of Canada, by hunting and fishing. All along the northern tundra roam tribes who depend, like the Lapps and the Canadian Eskimo, on the herds of reindeer, wild or tame.

Far to the south in the half-desert region of Turkestan, cotton is now grown with the help of irrigation, for the Russians waste none of their vast territory. Their aim is to catch up with the more advanced countries of Europe, to supply as many of their own needs as they possibly can, and to raise the standard of living, education and health among the many backward peoples of the U.S.S.R.



WOLF.



Granite: Coombstone Tor, Dartmoor. Dartmoor is a high lump of granite. Its rounded surface is covered with grass, heather and peat-bog, where sheep-farms are scattered and lonely. Here and there piles of granite blocks or "tors" stand up like pieces of giant masonry. As the rock cooled and shrank, irregular joints, horizontal and vertical, were formed.

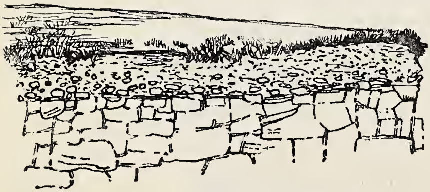
CHAPTER 18

BRITAIN'S BASIS

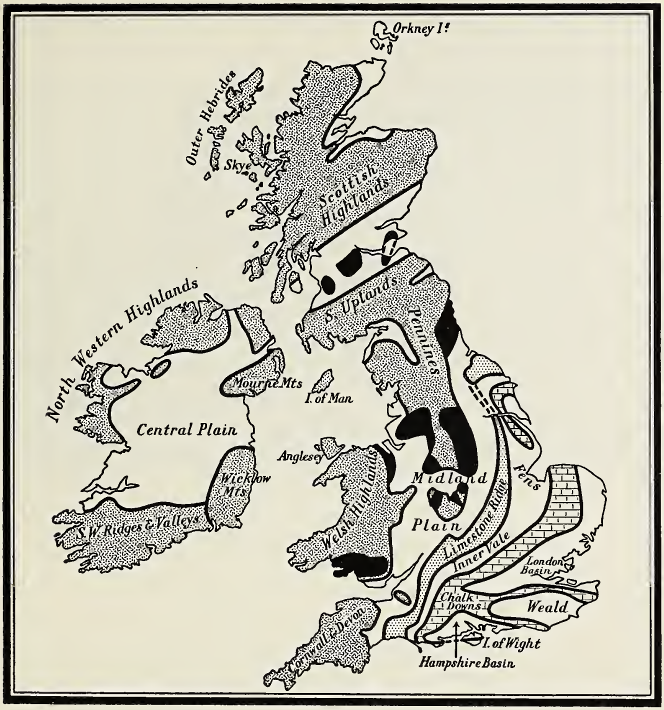
WE found the great Plain of Russia dreary in its sameness. An hour's train journey in our own country will take you through more kinds of landscape than a day's journey in Russia.

Scenery depends on soil, and soils are formed from what lies just below the earth's surface. This may be hard rock or soft sand or clay. In a land like Britain the rocks may lie deep, but in a quarry or railway cutting or in the mountains we can see plainly the rocks of which they are built.

Some rocks, such as granite or lava,

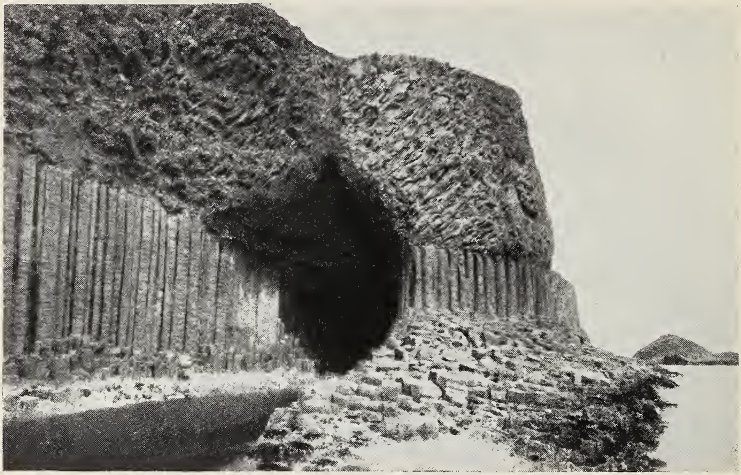


Soil, Subsoil and Rock.


Orkney Is
Outer Hebrides
Skye
Scottish Highlands
North Western Highlands
S. Uplands
Pennines
Mourne Mts
I. of Man
Central Plain
Anglesey
Wicklow Mts
Welsh Highlands
Midland Plain
Fens
Limestone Ridge
Inner Vale
S.W. Ridges & Valleys
London Basin
Chalk Downs
Weald
I. of Wight
Hampshire Basin
Cornwall & Devon

Highlands, Uplands and Lowlands of the British Isles.

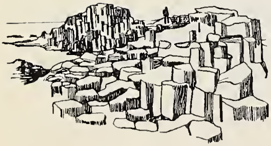
were once fiery liquids, for they came from the interior of the earth, where everything is molten, like iron in a blast-furnace. As the molten rock cooled, it shrank into irregular masses. *Granite* is a very hard, speckled rock with a general grey or pink colour. It forms highlands such as Dartmoor or some of the moors of Scotland. In places it is quarried for building stone, and Aberdeen has been called the " granite city " because it is built of



Lava: Fingal's Cave, Staffa. As the lava cooled, it shrank into the six-sided columns seen in the middle of the photograph. Each column is also divided by horizontal joints; these are seen in the stumps in the foreground, where columns have been beaten down by the waves. The rock under which the lava columns are buried is a hardened volcanic ash.

it. *Lava* flows hot from cracks in the earth's surface or the craters of volcanoes, but in these islands that happened a very long time ago. Sometimes it shrank into six-sided columns, which look like dark " organ-pipes." A sheet of lava forms the soil of North-East Ireland, but there the " organ-pipes " are only to be seen on the sea edge in the famous " Giant's Causeway."

Other rocks are formed of material carried by rivers out to sea and dropped in layers on the bottom. This material has been worn from the land-surface by the frosts and rains of the long-distant past. As the sea-bottom became more thickly covered, the weight squeezed the mass into solid layers. In some cases, such as sandstone, the separate

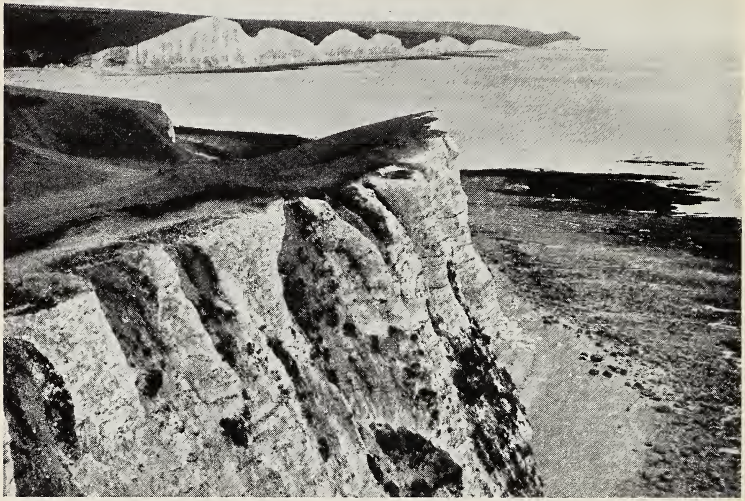


The Giant's Causeway.

Clay: The country of the Norfolk Broads is low and flat; rivers are sluggish.

grains are tightly cemented together. In others, such as clay, the separate grains are closely packed but are not cemented together. The particles of clay are finer than the grains of sandstone, so that where these masses have been lifted by earth movements to form dry land, the clay holds up water, while the sandstone generally lets it through. But the clay particles are easily washed away, so that clays form low flat plains, as in the Norfolk Broads. Sandstone, on the other hand, is dry on the surface and, if hard, forms hilly country. But if the grains are only loosely bound together, the sandstone country becomes a rolling lowland. Clay is used for making bricks, but hard sandstones are quarried for building stone.

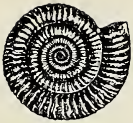
Chalk and Limestone are composed of the shells of dead sea-creatures which, in the same way as clay and sandstone, were



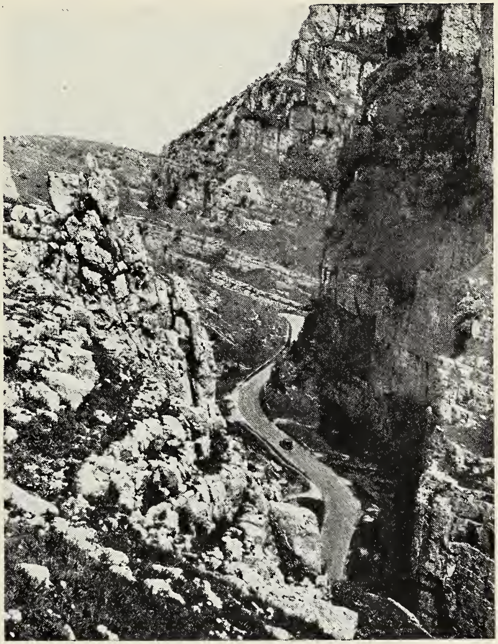
Chalk: The Seven Sisters, Sussex, are the white cliffs at the end of seven rounded chalk ridges with intervening dry valleys. The thinness of the soil on the top of the chalk is well shown.

piled up in layers on the floor of the sea. *Chalk* is soft and has little mud mixed with it. White chalk cliffs are conspicuous features of the coasts of Kent and Sussex. Inland the chalk forms rounded grassy hills, called Downs in the south, Wolds in the north. Chalk absorbs water like a sponge, and many towns of South-Eastern England get their water supplies from it. But, to look at, it is a dry land. Most of its valleys are without streams, though in winter streams known as "winterbournes" sometimes run for a few months. The short grass feeds many sheep, and the dry springy turf is admirable for training racehorses.

Limestones are common. They give rise to higher and rougher



A FOSSIL.



Limestone: Cheddar Gorge in the Mendip Hills of Somerset. The grey rock lies in thick bands, and much shows through the thin soil. As the layers are split up by vertical joints, the walls are nearly perpendicular or drop by narrow steps or terraces.

mountain scenery than the chalk, as in much of the Pennines and of North Wales; and where there is grass many sheep feed. Rain soaks through limestones, for they have usually many cracks, and the acids in rain-water dissolve the lime. There are few streams on the surface. The water sinks down and flows in underground channels to come out through a cave at the base of a cliff. Cheddar Gorge is probably an old underground channel with the roof fallen in.

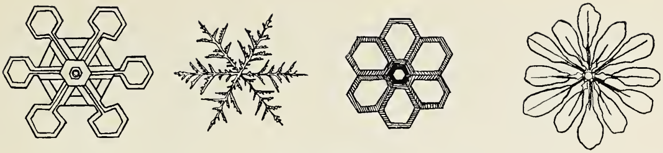
Coal is formed of plant remains. Sometimes ancient swampy forests became buried beneath layers of mud and sand as the land sank; and the trees and plants decayed and hardened into seams of coal.

Four blocks of highland fill up most of the north and west.

They rise to between 3,000 and 4,000 feet, because their rocks are hard—granites, sandstones and limestones—and they are deeply cut up by many river valleys, such as the Upper Severn in Wales. Their wind-swept surfaces are covered with grass, heather, bracken and peat-bog. Scattered farms rear half-wild sheep. Sometimes a quarry, such as the slate quarries in North Wales, gashes a mountain side. The chief coal-mining districts and manufacturing towns lie along their borders.

Between the four highland blocks are three lowlands—in Central Scotland and round the Mersey and Severn Estuaries. The last two provide easy ways to the sea from the Midland Plain of England.

In contrast to the highland blocks and Midland Plain of the north-west, South-Eastern England is a " softer " country of low ridges with vales and basins between them. Two ridges—of limestone and of chalk—slant across this country from Yorkshire to Dorsetshire. These ridges rise from 500 to 1,000 feet or over and enclose a broad clayey vale, of which the Fens occupy the part round the Wash. Further south there are other chalk ridges extending eastwards from Salisbury Plain like the four fingers of a hand. These fingers enclose three lowlands, the London Basin, the Weald and the Hampshire Basin.



Snow Flakes.

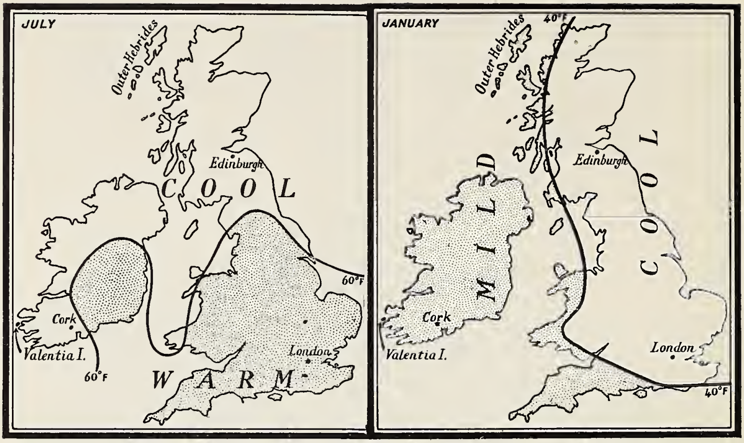
CHAPTER 19

THE BRITISH CLIMATE

THE British Isles extend from latitude 50° N. (Lizard Point) to 60° N. (Shetland Islands). They lie, therefore, in the Cool Belt, where we might expect a short hot summer and a long cold winter. But we get neither. Our seasons are comparatively mild. Thanks to the Atlantic Ocean and our prevailing westerly winds our summers keep fairly cool and our winters rarely get very cold.

Summer is warmer than winter because of two facts which you can observe for yourself: in summer the sun is higher in the sky, and it shines for a longer time. In June the sun takes a high path across the sky. At noon it stands over 60° above the horizon. The day is more than sixteen hours long; by Greenwich time, the sun rises before 4 a.m. and sets after 8 p.m. Yet we rarely get very hot days, as they do in Central Europe. For in summer the Atlantic keeps cooler than the land, and the westerlies bring its cool air to us. The winds keep the west side of Britain cooler than the east in summer, though both sides grow cooler as they run northwards.

In December the sun takes a low path across the sky; even at noon it is only 15° above the horizon. In addition the winter day is less than eight hours long; sunrise is after 8 a.m. and sunset before 4 p.m. Yet we do not get the intense cold of Central Europe. For the North-East Atlantic is kept exceptionally warm owing to the drift of warm surface water from the

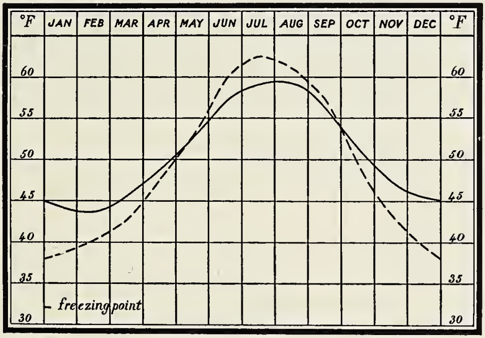

JULY
Outer Hebrides
Edinburgh
C O O L
60°F
Cork
Valentia I.
London
60°F
W A R M
JANUARY
40°F
Outer Hebrides
Edinburgh
M I L D
C O O L
Cork
Valentia I.
London
40°F

Temperatures. (*a*) July. In the south the sun climbs higher in the sky than it does further north. The higher it climbs, the more heat we receive, so the south is warmer than the north; London is warmer than Edinburgh. But at the same time the westerlies bring cool air from the Atlantic, so that the west is cooler than the east in the same latitude; Cork is cooler than London. (*b*) January. The sun is weak and the warm westerlies are strong, so that the west is warmer than the east; the map shows that not only Cork but also the Outer Hebrides are warmer than London.

south past our coasts; and the westerly winds, which in winter are strong and frequent, bring its mild air to us. There are few winter days when we cannot work or play in the open. Since this warmth comes from the west, the land grows colder from west to east. This is one reason why our skating championships are usually decided on the Lincolnshire Fens.

Thus, on the whole, the west is cooler in summer and warmer in winter than the east. This fact is made clear by the temperature curves in the accompanying figure; the curve for Valentia in South-West Ireland does not fall so low in winter nor does it rise so high in summer as does the curve for London.

Since the temperature depends so much on the nearness to water, it should be added that everywhere in these islands the interior is warmer in summer and colder in winter than the coasts. The water has a further effect—it slows down changes of temperature. The interiors of continents in the Cool Belt pass almost at once from winter snow to summer heat and again from heat to snow in autumn. Our springs and autumns are long and gradual.

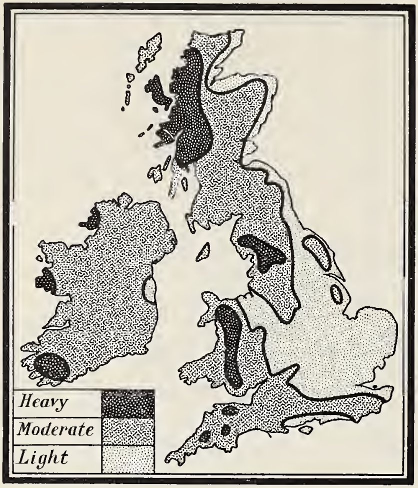


Mean Monthly Temperature at Valentia (continuous line) and London (broken line). Compare the two curves and give reasons for the differences.

At all seasons temperature decreases as height increases, the rate of loss being about one degree Fahrenheit for every 300 feet we rise. This is well shown by the comparison of the top of our highest mountain with the town at its foot.

Station.	*Height.*	*January.*	*July.*
Fort William	40 ft.	39° F.	57° F.
Ben Nevis	4,406 ft.	23½° F.	42° F.
Difference	4,366 ft.	15½° F.	15° F.

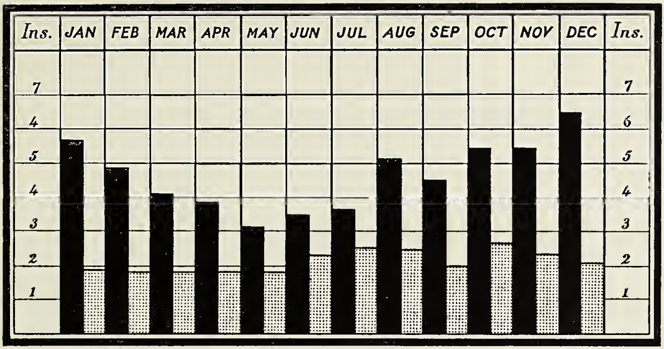
But climate does not depend on temperature alone; rainfall is equally important, and ours is brought mainly by our



The Distribution of Rainfall. The west is wetter than the east, and in the west the highlands are the wettest of all.

friends the westerly winds. It comes with "disturbances" which might be likened to eddies in a river. When these are announced in the daily weather forecast, we know that we must expect changeable weather-conditions of temperature, wind and rain. At such times the Weather Office at the Air Ministry may be bombarded with telephone calls and telegrams. The ice-cream merchant asks whether it will be hot or cool; the sailor receives warnings of gales; and the hay-making farmer wishes to know whether it will be wet or fine.

We have seen elsewhere in the world how air laden with moisture is forced to climb over mountains and drops that moisture as it rises. Our own mountains and hills lie mainly in the west and take the first and heaviest toll of all the moisture that comes ashore. So the Western Highlands of Scotland, the Lake District and Wales get more than three times as much rain as our eastern counties. In winter, of course, it often comes in the form of snow; but the frozen water in each snowflake is so much expanded and the crystals in each flake so loosely bound together that a foot of snow only contains an inch of rain. Fort William's rainfall is 80 inches a year, which most of us would think enough, but the mountain behind it



Mean Monthly Rainfall for Valentia (black pillars) and London (dotted). Compare the two sets of pillars and give reasons for the differences. What is the total rainfall at each place?

is more than twice as successful (or unlucky) in extracting moisture from the clouds. Of snow or rain Ben Nevis' summit gets 171 inches a year. But in 1923 parts of both Wales and Cumberland beat it with 247 inches, or over 20 feet. An inch of rain means a ton of water on every acre that it covers.

The Hedger is cutting, trimming and strengthening the bushes into a neat hedge; it will make a strong fence and be close enough to provide some shelter from wind and weather. Live or " quick " hawthorn is generally planted and adds much to the greenness and beauty of the English lowlands; hedges are less common in other countries. On our western hills and mountains " dry " stone walls are built instead of hedges. In the fen country ditches divide fields.

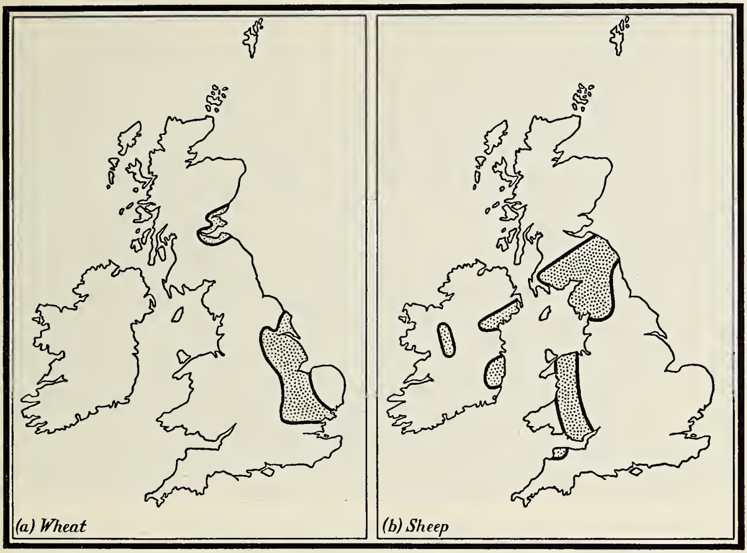
CHAPTER 20

THE BRITISH FARMER

"MIXED farming," which produces both animals and crops, is by far the commonest type in this country, though there are more sheep and cattle reared in the wetter west and more grain crops grown in the sunnier east.

But sunshine is not enough. A crop like wheat takes a great deal out of the land. Farmers have learnt to make good the loss by growing different crops each year in a scientific " rotation." Formerly a field had to lie idle or " fallow " one year in three while it regained its stores of

Barley.

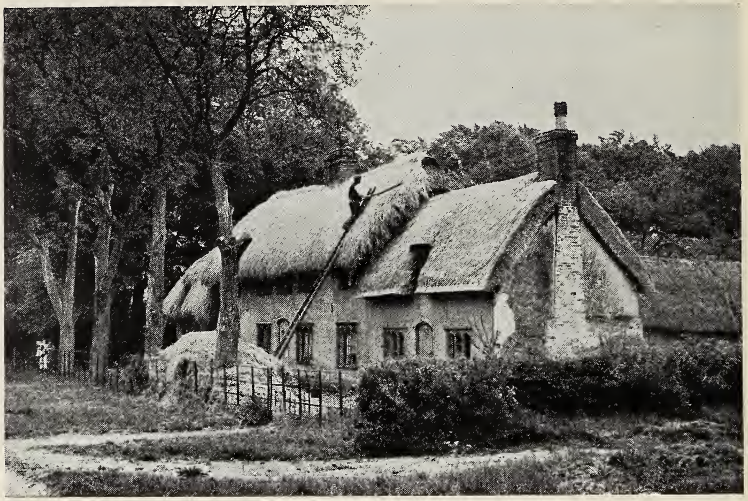


Distribution of Wheat and Mountain Sheep. Note that the wheat is on the dry eastern sides of England and Scotland, the mountain sheep on the west and in Ireland.

plant food. Nowadays that field may be sown with wheat one year, with " roots " such as turnips, potatoes or sugar-beet the next, with barley in the third year and with peas, beans or clover in the fourth. Other " rotations " may be used, but the idea is the same. Each crop takes up different plant foods from the soil, leaving the supply of the other kinds to recover. Extra help, however, is given by ploughing in farmyard and " chemical " manures.

Thus by varying the seed sown in different fields a farmer can have wheat and barley to sell for human use, and roots or clover for his animals to eat in winter when his pastures have

WHEAT.



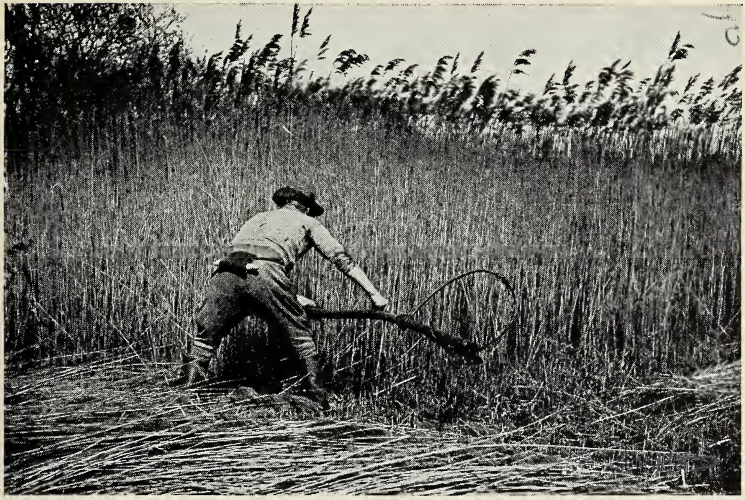
The Thatcher is using wheat-straw. He lays it lengthwise down the slope of the roof, pegs it down and trims off the edges. In East Anglia bundles of reeds from the Norfolk Broads are used for thatching.

little " feed " for them. So his roots and clover are turned into meat, milk or wool and come to market, as it were, at second hand.

Sheep are found nearly everywhere, but there is most room for them on the hills of the West and North, and they were originally mountain animals. There the rainfall is often heavy, but soon drains away. Sheep can stand wet on their fleeces but not about their feet, where it soon causes sores. They thrive on the short and often scanty pasture of thin soils, but in winter they are often brought down into the valleys for food and shelter.

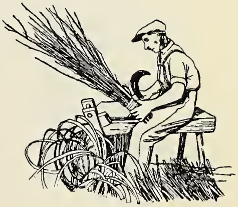
Cattle cannot scramble over rough hillsides and need richer pasture than sheep. Wet fields do not harm them, and

Oats.

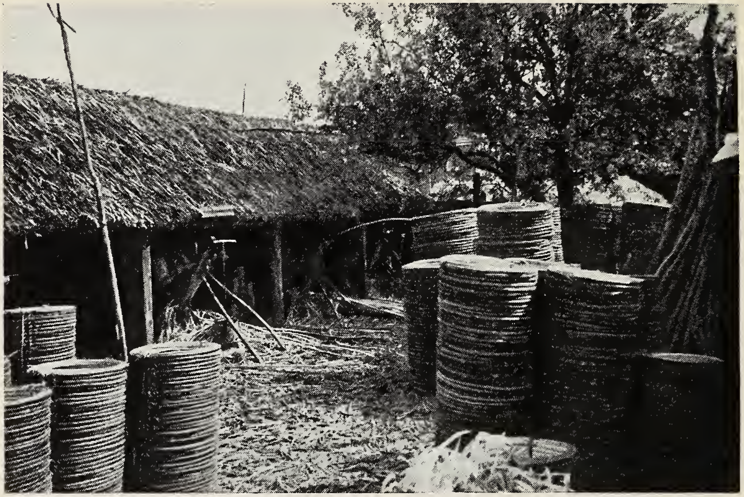


Cutting Reeds for Thatching, on the Norfolk Broads. Notice the waders, whetstone and scythe. What is peculiar about the last? Why is it so made?

they flourish on the clay lowlands where the grass grows thick and juicy. If they are meant for the butcher, they may be bred in remote districts like Aberdeenshire, Anglesey or Ireland and brought for fattening to good pasture near the larger towns. But many go to form the dairy herds which supply us with milk, butter and cheese. Milk needs quick delivery, but with modern transport it can safely travel as much as 150 miles. So the towns of Lancashire can easily take their milk from the farms of the Cheshire plain, and London may find its supply as far afield as Somerset. In Cornwall, Devon or Ireland, when local needs have been met, farmers must use their surplus for making butter, which will keep longer; and they feed the "skim" to their pigs.



THE BESOM MAKER.



Hoop-making was once a flourishing industry in the south-east. A flexible wood (willow, for instance) is split and cut to standard lengths for nailing round barrels. Thousands used to be exported to the West Indies for sugar; to-day they are used mainly for fruit and fish barrels.

The most widespread grain crop is oats, for it thrives in cold or wet places where few other grains will grow. But oatmeal is too crumbly to make good bread. Barley is equally hardy, but for bread-making equally unsatisfactory. So in these islands it has always been the " drink-corn " used to make beer and whisky. The best barley for this purpose, however, is more particular as to soil and climate even than wheat, and is mainly grown in the eastern and drier counties of Great Britain and Ireland.

Wheat is our only " bread-corn," and we grow far less of it than we need to feed our population. Though more widely grown (except in Ireland) than malting

The Hurdle Maker.

barley, it shows an equal liking for sunshine, but suffers less from rain and wind. It flourishes most in eastern England, especially from South Yorkshire to Essex.

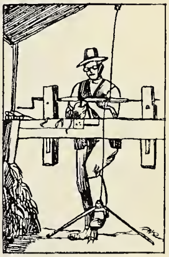
Market-gardeners provide vegetables, soft fruit such as gooseberries, strawberries and raspberries, and flowers for those who cannot grow their own. Such things soon spoil, and they are commonly grown near towns, where they are most needed. London is surrounded by market-gardens, and they are equally plentiful near the big manufacturing towns of the Midlands and the North. But they may lie further from their customers if fast traffic connections make up for the added distance. The Fenlands, for instance, supply great quantities of small fruits, potatoes and flowering bulbs. In other places, such as Cornwall, the Scilly Isles and the Channel Islands, mild winters and early spring sunshine bring on the flowers and early potatoes long before they are ready elsewhere.

The orchards of Kent and the west country produce much fruit, especially apples and plums. The canning of fruit and vegetables, a new industry in this country, will encourage the growers of these very perishable goods. The apples of Herefordshire, Devon and Somerset are mainly used to make cider, a favourite drink in the West of England.

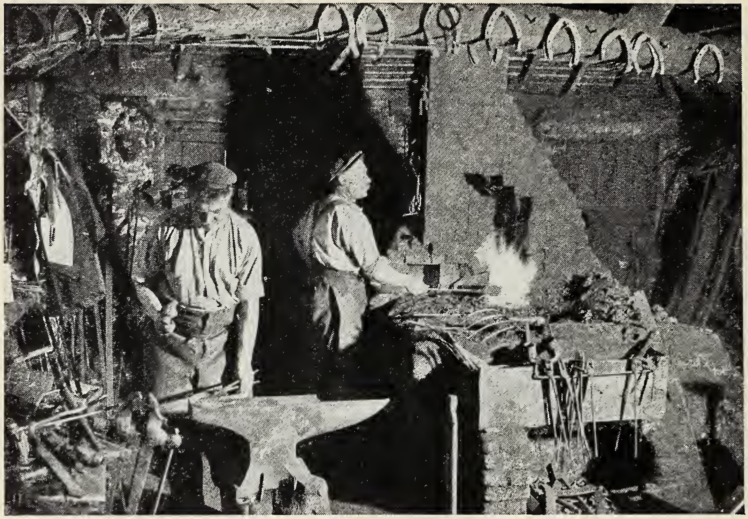
Hops to flavour beer and flax to make linen are now grown only in certain districts. Our home supply of hops comes from Kent and Herefordshire, and the flax of north-east Ireland is sent to the mills of Belfast and other Ulster towns.

Cheap production in factories at home and abroad has killed many country trades, but some still survive owing either to their nature or to some special advantage. The pictures in this chapter show some of these.

Nowadays less land is ploughed and more sown with grass to feed cattle. Grain can be grown more easily in Canada, Australia and Argentina, and imported more cheaply. But fresh meat and milk cannot be imported,



Turning a Chair Leg in the Chilterns.

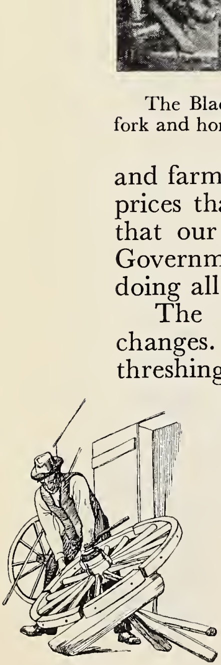


The Blacksmith and his Forge. Notice fire and blast, anvil and tools, manure fork and horseshoes ready to be shaped and fitted.

and farmers find that the butcher and the dairyman offer better prices than the corn merchant. But there is always a danger that our overseas wheat supplies might be cut off, and the Government, by promising the farmer a reasonable profit, is doing all it can to encourage corn-growing.

The increasing use of farm-machinery is making great changes. Standing steam-engines for cable-ploughing and threshing were introduced a hundred years ago, but modern oil-driven tractors do the work of many horses. Electricity has also many uses on the farm, from chaff-cutting to the milking of cows.

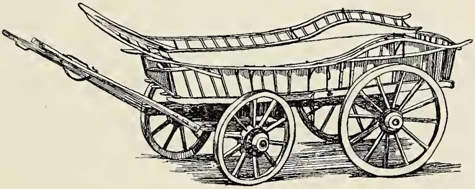
With machinery fewer men are needed, which is perhaps fortunate, since fewer are to be found. Low



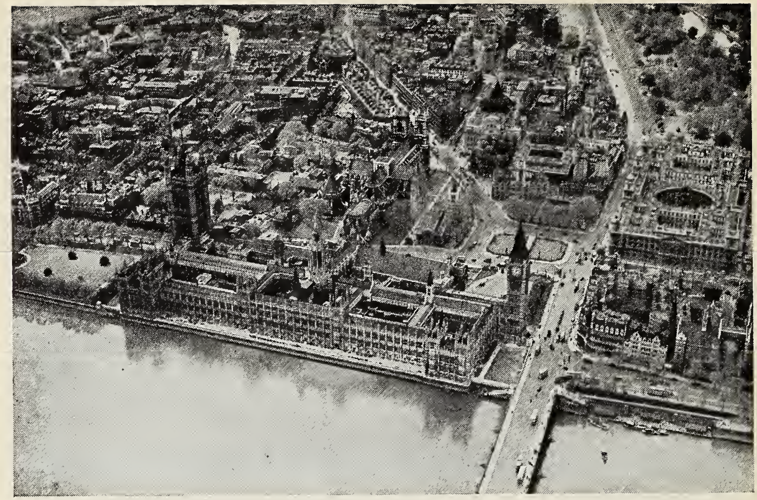
The Wheelwright.

wages have driven many to find work in towns and factories, and only mechanics are likely to return. Machines, moreover, do their work so quickly that the fullest use can be made of our short spells of good weather for ploughing, hay-making and harvesting. But machines are expensive and can only be used profitably on large farms or by smaller farmers combining together, a thing they are not often anxious to do.

Combined action is still more necessary in the selling of farm produce. More and more the old small markets are being deserted in favour of the big centres in London and other great cities. Central markets are found to be the most economical, and the Government, in the interest both of the farmers and the people who use their products, is trying to extend to other things, such as pigs, the system that already deals with our milk supply.



Farm Waggon with Raves to carry Harvest Loads



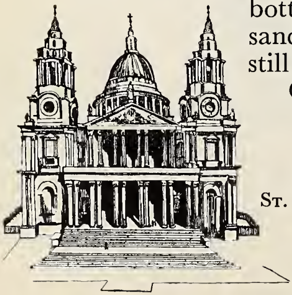
Air View of the Houses of Parliament and Westminster Abbey. The Houses of Parliament are along the river with the clock tower containing " Big Ben " at the right end. Westminster Abbey is just behind. Westminster Bridge is in the foreground, Government offices on the right and St. James's Park behind them.

CHAPTER 21

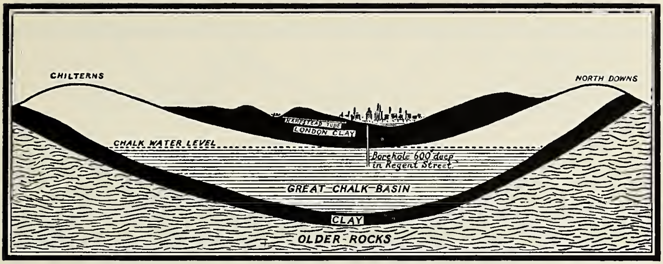
THE LONDON BASIN

THIS shallow hollow of the chalk is rather like a trowel with its northern rim on the Chiltern Hills and its southern on the North Downs. Eastwards it is broken by the estuaries of the Thames and other rivers; westwards it extends between two chalk ridges to the source of the River Kennet (for the Upper Thames belongs to another region). The bottom of the hollow is covered with gravel, sand and clay laid on the chalk whilst it was still under the sea.

Gravel hills stand out as at Mill Hill and



St. Paul's Cathedral.

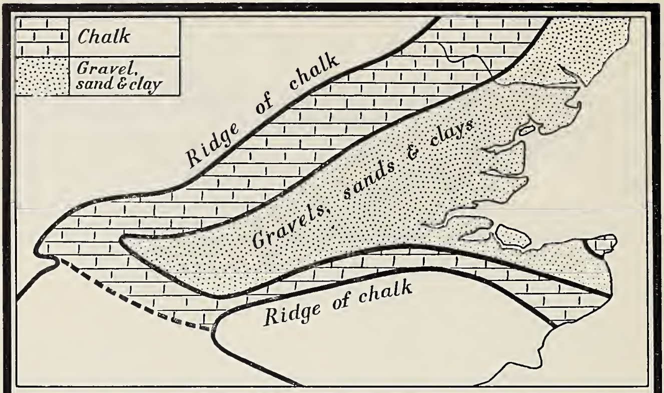


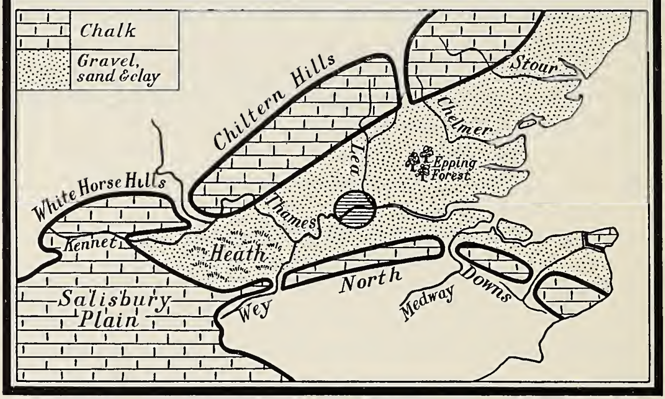
A deep well sunk through the London clay into the water held by the chalk. The position of a London tube is shown in the clay.

Hendon, dry islands among the wetter clays. The less fertile sand makes barren heaths, used sometimes for training soldiers, as at Aldershot, and sometimes, as at Hampstead Heath, for popular play-grounds. Epping Forest retains its oakwoods, but most of the open country is grass land or market-gardens. Except London itself there are few large towns, but many outer suburbs such as Croydon and St. Albans on the breezy dry chalk rim of the Basin. Further west lies Reading, where Thames and Kennet meet, one of the few towns with a life of its own apart from London.

Under London itself the deep clay has made it easy to tunnel the Underground Railways, which take people so quickly from the growing suburbs to any part of London or out of it. The chalk under the clay holds much of London's water-supply, which filters down from the open chalk rims of the Basin.

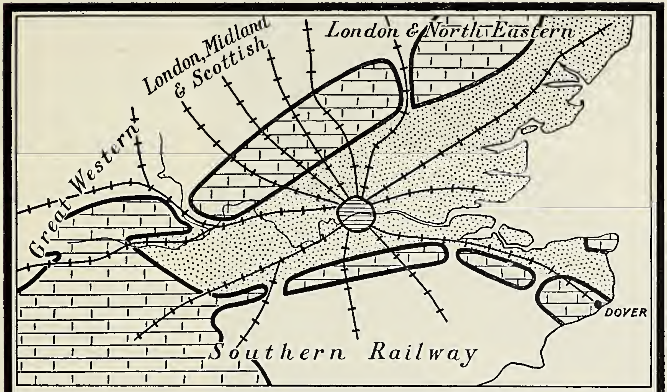
To London's eight million inhabitants other millions, who come from the outlying towns where they sleep, are added every morning. Farms and market-gardens send their milk, vegetables and other produce to London's markets. Roads and railways find their way through the gaps in the chalk rims, such as the Thames Valley, to bring more distant

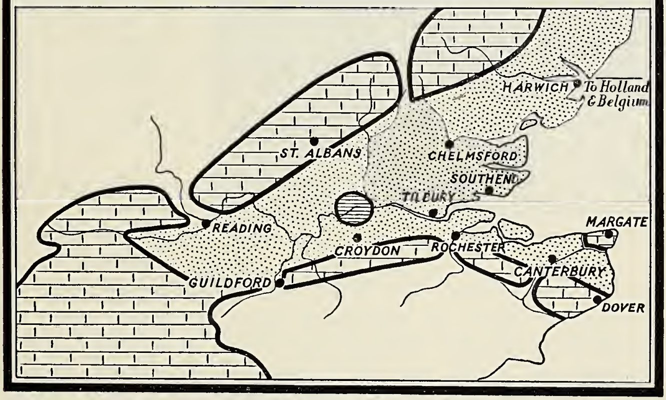

Chalk
Gravel, sand & clay
Ridge of chalk
Gravels, sands & clays
Ridge of chalk


Chalk
Gravel, sand & clay
Chiltern Hills
White Horse Hills
Kennet
Heath
Salisbury Plain
Wey
Thames
Lea
Epping Forest
Chelmer
Stour
North Downs
Medway

London Basin (1). The shape is like a trowel with the handle on the west and open to the east and the North Sea. The rims are of chalk, and the bottom is covered with gravels, sands and clays.

London Basin (2). The Lower Thames flows along the bottom of the "trowel" and tributaries join it from the two sides. But some tributaries, like the Medway, have cut notches or "gaps" through the edges.


London, Midland & Scottish
London & North Eastern
Great Western
Southern Railway
DOVER


HARWICH
To Holland & Belgium
ST. ALBANS
CHELMSFORD
SOUTHEND
TILBURY
READING
MARGATE
CROYDON
ROCHESTER
CANTERBURY
GUILDFORD
DOVER

London Basin (3). Railways gather to London; some of them use gaps through the chalk, others use tunnels.

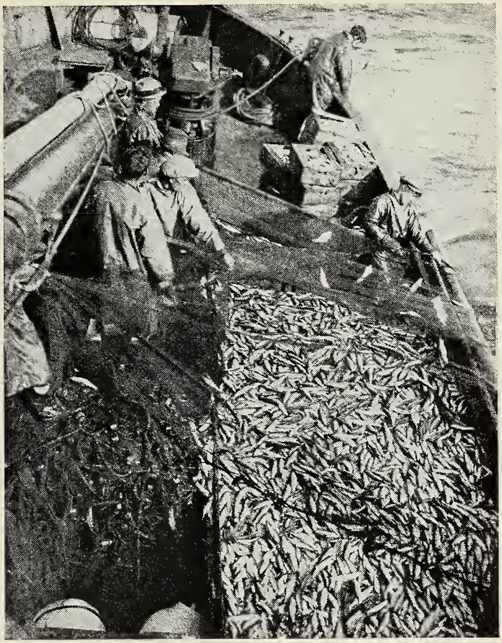
London Basin (4). Some towns (suburban), markets and railway junctions at gaps, ports and sea-side resorts.

The Thames at London. Ships are at the quays, which are equipped with many cranes for rapid loading and unloading. Tugs are towing barges, loaded and unloaded. The Tower Bridge is in the distance.

produce and people to the capital. On the coast are many seaside resorts, such as Southend and Margate. Harwich and Queenborough, on either side of the Thames Estuary, provide convenient ports for continental traffic.

A city is not to be admired just because it is big, and there are many ways in which London could be improved. But its greatness—not merely in size—is a real thing, the growth of many centuries. It is the centre of government. In the Houses of Parliament the laws are made which the great Government Offices of Whitehall have to carry out. Close by stands Westminster Abbey, the centre of our national life, and across the Parks are the palaces of the King. Religion, Justice, Medicine, Art, Science, and all forms of learning as well as the Army, the Navy and the Air Force, have their centres in London. All main roads start from London, and every other means of communication, from the railways to the radio, has its headquarters there.

But London is not only a centre of government and

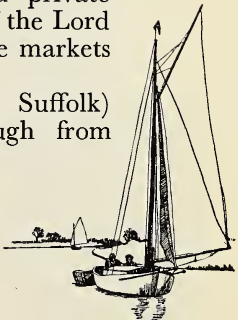


East Anglian Herring Fishery (1). The nets are being hauled in. The fish, which are seen caught by the gills, are shaken out into the compartment underneath as the net is drawn over it. See also picture on page 98.

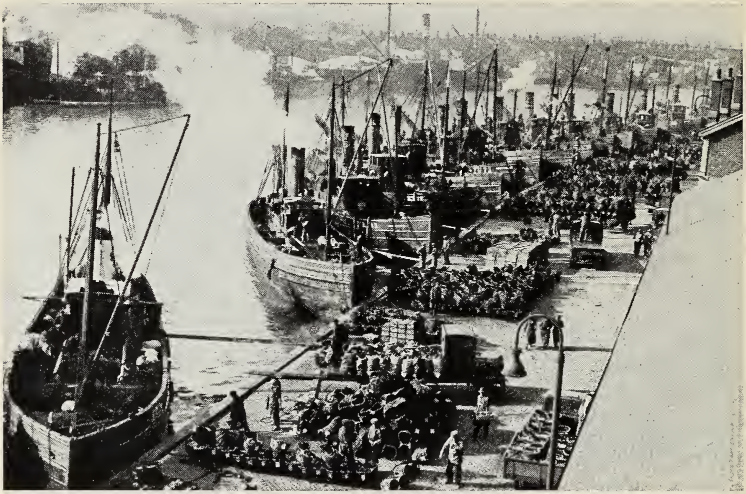
learning. It is also a great sea-port, and to this fact, which is rare among the great capitals of the world, it owes its special importance. Its docks extend down river as far as Tilbury in Essex. This " East End " is a great industrial region, which gets most of its fuel and raw materials from the ships that come to its many docks.

The " City " of London lies between the " East End," with its factories and crowded dwellings, and the " West End," with its museums, theatres, luxury shops, clubs and private houses. The Bank of England, the Mansion House of the Lord Mayor of London, the great Exchanges and produce markets are all in the City, and so is St. Paul's Cathedral.

Northern Essex and East Anglia (Norfolk and Suffolk) complete the London Basin. They lie far enough from



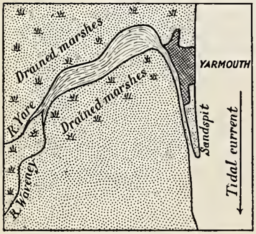
On the Broads.



East Anglian Herring Fishery (2). The fishing boats or "drifters" are small but sturdy craft to battle with rough seas. About 700 of them are engaged in the East Anglian fisheries. Some of these are drawn up at Yarmouth and have just unloaded their fresh catches. Many of the fish will be cleaned, salted and packed in barrels for export to European countries.

London to have a life of their own, yet near enough to feel its influence. The chalk rim here gives rise to rivers such as the Stour. Like the Thames, they flow through clays and sands and gravels till they reach the tide, whose fall leaves banks of mud in their lower courses. Tidal currents, sweeping down from the north, are steadily destroying the soft low cliffs of the coast and are building, with the stolen materials, banks of sand and shingle across the river-mouths.

The port of Yarmouth stands on one of these banks. A wide lagoon, divided by low grassy banks of mud brought down by the rivers, lies behind it. The



YARMOUTH.

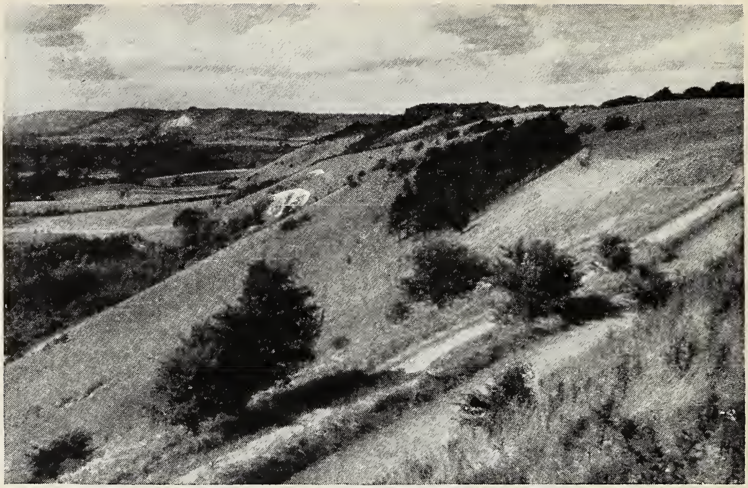
shallow lakes, connected by narrow channels, are known as the Norfolk Broads. Their reeds are cut for the local thatching. (See picture, page 409.) They also offer safe sailing for holiday-makers and quiet pools for the wild fowler and the bird watcher.

East Anglia has long been known for wise farming, and led the way to better methods and machinery a hundred years ago. Wheat, barley and sugar-beet are widely grown. Wheat flourishes in the stiff clays and sunny climate of this least rainy corner of England, and sugar-beet, which also needs much sun, can replace other root-crops in the ordinary rotation.

The county-towns are great markets, but they have also special industries. Round Norwich, mustard is grown for table use. This ancient cathedral city is also an engineering town. Ipswich makes farming tools and machinery, and so does Chelmsford, which also has important corn-mills.

Yarmouth and Lowestoft are ports for the North Sea fishing fleet. Every autumn girls from Scotland come there for the herring-curing. There are many holiday resorts on the coast of East Anglia for those who enjoy a bracing climate.

Bittern.



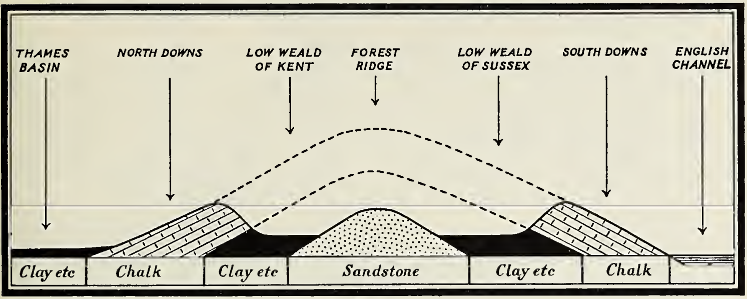
The North Downs in Surrey. This is the steep southern edge; the chalk shows through in several chalk pits. The soil is thin and covered with grass and thorny bushes. Here and there on the summit, where soil is deeper, are copses of low-growing trees, probably beech. At the foot of the slope the clayey soils are under cultivation.

CHAPTER 22

THE DOWNLANDS OF SOUTHERN ENGLAND

SURREY, Kent and Sussex form the peninsula that links England most closely with the continent. The heart of these three counties is the Weald.

Along the centre of the Weald rises the sandstone Forest Ridge, ending in the brown cliffs of Hastings. This well-wooded hilly belt forms the High Weald. Both north and south it falls to the clayey plains of the Low Weald; of which the northern ends in Romney Marsh, now drained by ditches. The whole Weald is enclosed by steep grassy walls of chalk, the North and South Downs. The North Downs reach the


THAMES BASIN
NORTH DOWNS
LOW WEALD OF KENT
FOREST RIDGE
LOW WEALD OF SUSSEX
SOUTH DOWNS
ENGLISH CHANNEL
Clay etc
Chalk
Clay etc
Sandstone
Clay etc
Chalk

Section from North to South across the Weald, showing the original arch and the rocks at present on the surface.

sea in the " white cliffs of Dover," the South Downs at Beachy Head, which is equally white.

Originally this region was not a basin like the London Basin, but a broad arch of chalk with its highest part running east and west. But the chalk has been worn away from the summit and is now left only on the margins as the North and South Downs. In the centre the rocks once underneath the chalk are now exposed at the surface as described above.

The old arch naturally sent off rivers down the slopes to north and south, and they still flow in those directions. Rivers, of which the Medway and Sussex Ouse are examples, rise in the Forest Ridge and flow to the Thames and to the English Channel. On their way they have worked their channels down into the chalk, making gaps through the North and South Downs.

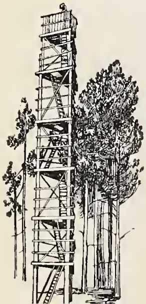
These river-gaps serve human travellers too. Towns such as Guildford in Surrey have grown up where gap-routes cross routes running east and west. These are both market towns and railway junctions as well. More examples both in the North and in the South Downs may be seen in the atlas. Each of these gaps is also used by a railway, though direct

On the Sandy Lands of the Weald there is much woodland. The trees are firs with rough bark, straight trunks and needle leaves. There is much undergrowth.

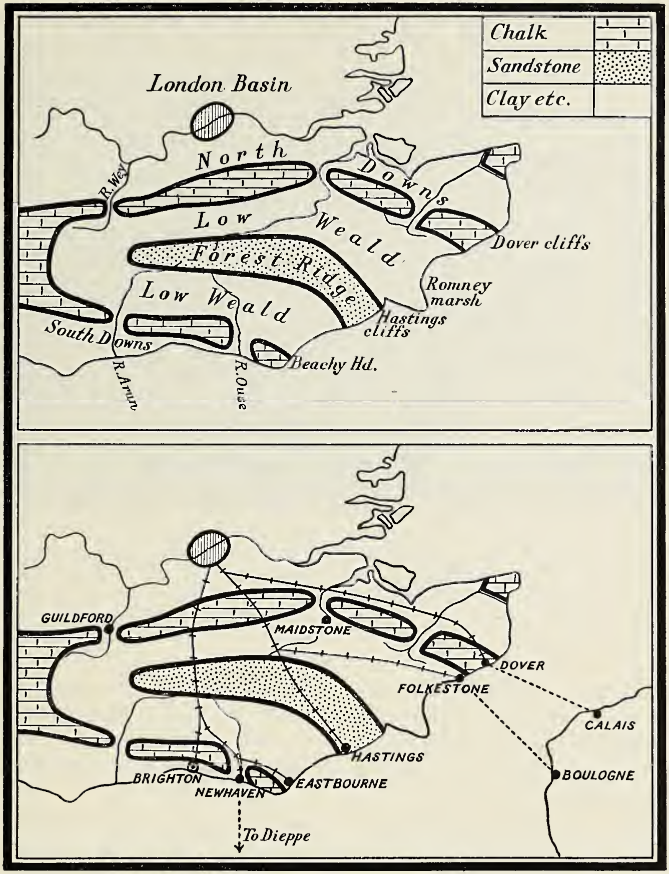
routes such as that from London to Brighton tunnel through the Downs to save precious minutes for their express trains.

But Brighton and the other coast resorts are comparatively new. It was the Channel ports that gave South-East England its first importance. From Dover cliffs the nearest shore of France is only twenty miles away. Kent saw the Britons land and afterwards their Roman conquerors. Our own Saxon ancestors secured a footing first in Kent, and in Canterbury St. Augustine built our first English church. William the Conqueror chose a Sussex beach for his invasion, because it lay nearer Normandy.

Some ancient towns along this coast have now become mere "ports of stranded pride," for their harbours are choked

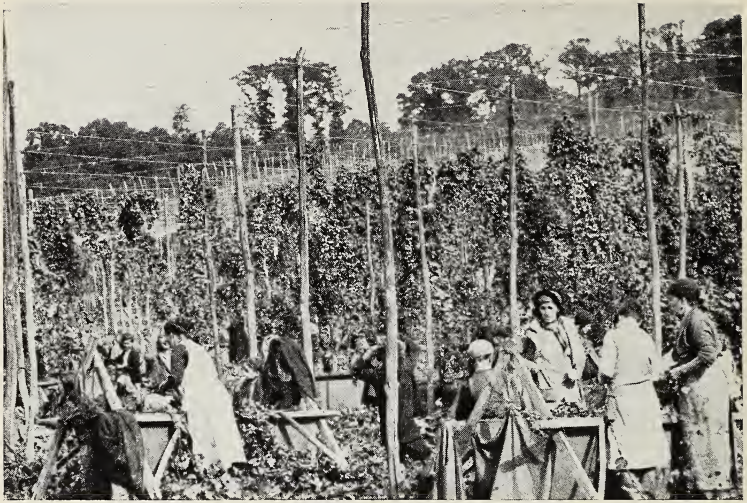


A Fire Look-out in the New Forest.


Chalk
Sandstone
Clay etc.
London Basin
North Downs
R. Wey
Low Weald
Forest Ridge
Low Weald
South Downs
Dover cliffs
Romney marsh
Hastings cliffs
Beachy Hd.
R. Arun
R. Ouse
GUILDFORD
MAIDSTONE
DOVER
FOLKESTONE
CALAIS
BOULOGNE
HASTINGS
BRIGHTON
NEWHAVEN
EASTBOURNE
To Dieppe

The Weald (1)—Surface and Rivers. The diagram shows the features as described in the text. Compare it with the atlas and find out the names of the rivers marked.

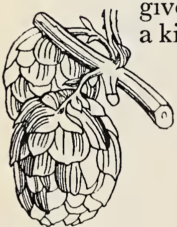
The Weald (2)—Some Railways and Towns. Some lines reach the south coast by tunnelling through the highest parts of the ridges, others follow the lowlands like those to Folkestone and Eastbourne. Three cross-Channel routes to France are shown.



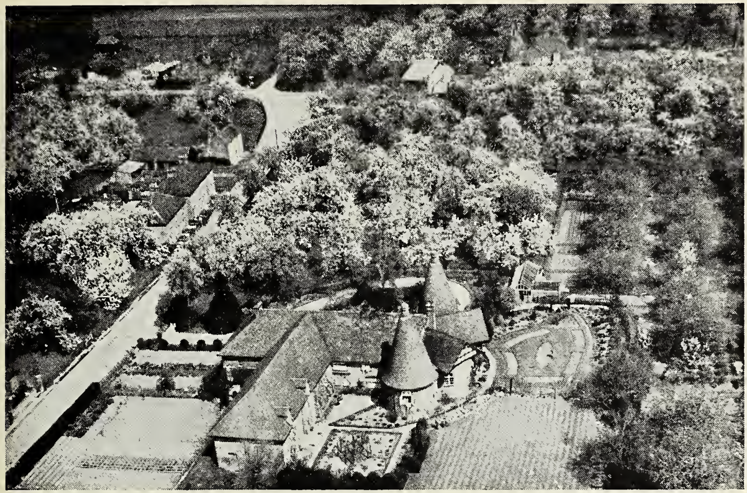
Hop-picking. Hops are planted about six feet apart and grow up wires supported by the poles as seen in the middle of the picture. High hedges, as seen in the background, usually surround the hop fields, to protect them from damage by wind. In front they have been pulled down, and the pale green flowers are being picked off by workers who have come down from the East End of London.

with sand. Nowadays Dover, Folkestone, and Newhaven take most of our traffic with France and Belgium for passengers and perishable goods. The direct route from Dover to London now follows the Low Weald to Tonbridge and then tunnels through the North Downs.

Kent has been called the " Garden of England " in praise of its fertility, but " London's Garden " might more truly describe it to-day. Its markets and orchards supply London's tables. The hops of the Maidstone district flavour London's beer. They also give employment to many families of Londoners, who make a kind of working holiday of the hop-picking season.



Hops.

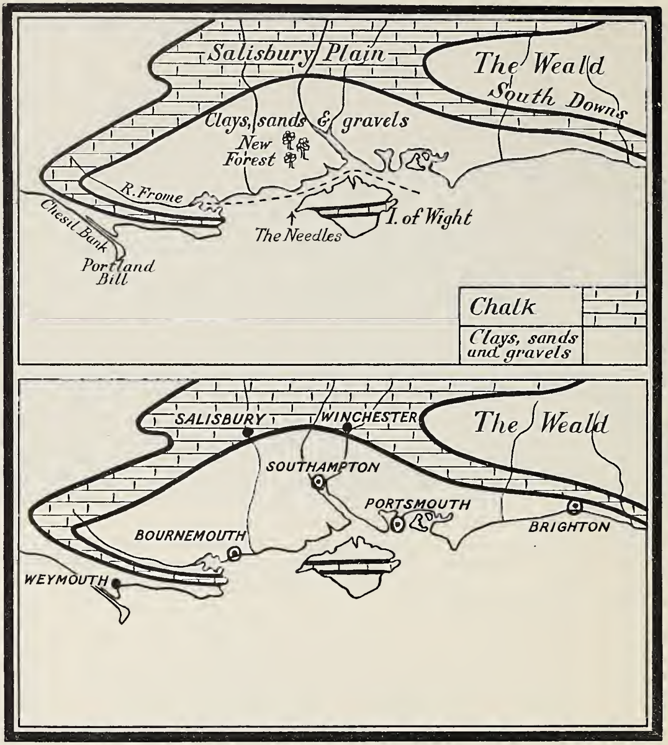


Oast-Houses. The hops are taken to heated barns, called oast-houses, for drying. These are round-shaped with conical roofs; two groups are seen in the picture. Less hops are grown than formerly, and the farm and oast-houses in the foreground have been turned into a country house. Orchards in blossom can be seen, for Kent is a famous fruit-growing county.

The South Downs and Romney Marsh feed many sheep, especially the breeds known as " Southdowns " and " Kents." The cattle of the Low Weald supply milk and beef. But the sandy Forest Ridge is largely covered with heath and woodland and is chiefly noted for its scenery. Surrey is perhaps the most beautiful of English counties. Its towns are mostly suburbs of London, and private houses and parks are scattered widely over the landscape.

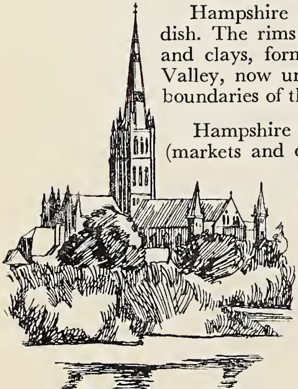
The Hampshire Basin was formed by a hollow of the chalk, like the London Basin, and filled with similar clays and sands. It extends from Dorset to Sussex and across to the Isle of Wight.

The River Frome is, or rather was, the central feature of

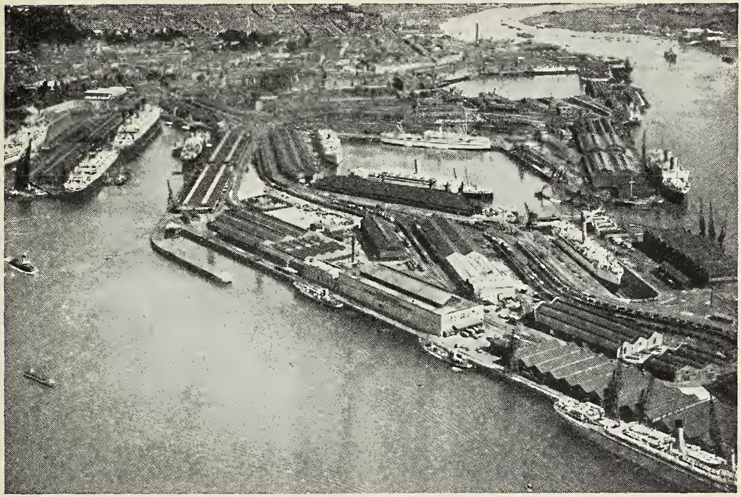

Salisbury Plain
The Weald
South Downs
Clays, sands & gravels
New Forest
R. Frome
Chesil Bank
Portland Bill
The Needles
I. of Wight
Chalk
Clays, sands and gravels
SALISBURY
WINCHESTER
The Weald
SOUTHAMPTON
PORTSMOUTH
BRIGHTON
BOURNEMOUTH
WEYMOUTH

Hampshire Basin (1)—Surface and Rivers. The surface is like a broad dish. The rims are of chalk; and the bottom is floored with gravels, sands and clays, forming much heathland. The old continuation of the Frome Valley, now under the sea, is marked by a line of dashes. Follow out the boundaries of the Hampshire Basin in your atlas.

Hampshire Basin (2)—Some Towns. Some important inland towns (markets and cathedral cities) are shown along the northern margin, and also a number of coast towns. Routes to the Channel Islands and France start from Weymouth and Southampton.



Salisbury Cathedral.



Part of Southampton Docks. Ships of all sizes, from the largest liners to small coastal boats, are at the quays; tugs are hauling coal barges or waiting to help vessels in and out. The quays are well equipped with customs house, cold storage plants and other warehouses; there are sufficient electric cranes for quick handling of passengers' luggage, mail bags and cargoes; motor lorries and long lines of trucks are ready for loading.

the Hampshire Basin, as the Lower Thames is of the London Basin. The chalk ridge of South Dorset and the Isle of Wight was once continuous, and the Frome then flowed on past the site of Bournemouth along the Solent and down Spithead.

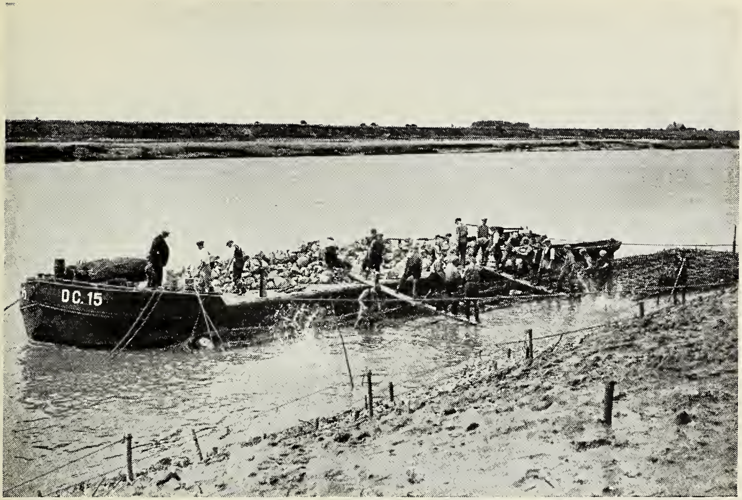
But since that time the land has sunk, and the sea has entered the old lower valley of the Frome, where it now forms the long channels of the Solent and Spithead. Southampton Water is the drowned valley of a tributary.

Mixed farming and market-gardening flourish on the richer soils, and the " Hampshire Downs " sheep tell their own story. But west of Southampton Water the less fertile sands are covered by the heather and woodlands of the New Forest. Ponies still run wild there and pigs feed on the acorns and beech nuts as they did in the Middle Ages. Along the coast, towns both large and small invite invalids and holiday-makers to enjoy the sunshine and the sea.

The long shingle beach of Chesil Bank joins Portland Island to the Dorset coast and protects the naval harbour in Weymouth Bay. But the best shelter is found behind the Isle of Wight. The dockyards of Portsmouth and the sea-plane base of Calshot supply the guard to the English Channel, the chief sea-gate of Britain; Cowes is the yachtsman's paradise, but the heart of the Hampshire Basin is Southampton.

The double tide of the Solent and Spithead gives Southampton a long high water twice a day. Big ships can therefore use the port more freely. Rail communication with London is easy, and Southampton has become its western port for passenger and mail traffic with France, America and other distant lands.

Unlike those of the London Basin, the inland towns of the Hampshire Basin are " haunts of ancient peace " which modern progress has been slow to disturb. Winchester and Salisbury are old market towns, county capitals and cathedral cities. Near the latter, on the open downs of Salisbury Plain, lies Stonehenge, an ancient, ruined monument that no one really understands.



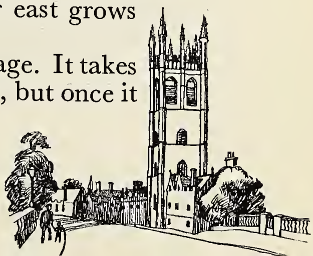
Protecting the Fens. A mattress of brushwood and reeds has been made and towed into position (part still visible on the right). The men are sinking it into position with heavy stones. There it will protect the bank under water from being washed away by tide and river. The scene is near the mouth of the Great Ouse.

CHAPTER 23

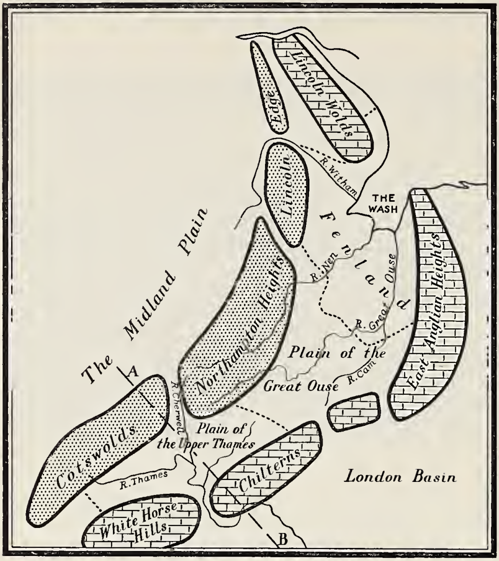
THE INNER VALE

TWO ridges, one of limestone and one of chalk, enclose the Inner Vale from Dorset to Yorkshire. At either end they come close together, but the floor of the Vale is twenty miles wide near Oxford and more than twice as wide across the Fens. This central area is all rich farming land, but the rainier west feeds more cattle and the sunnier east grows more crops.

The clay soil of the Vale needs careful drainage. It takes many years to get clay soil into good condition, but once it



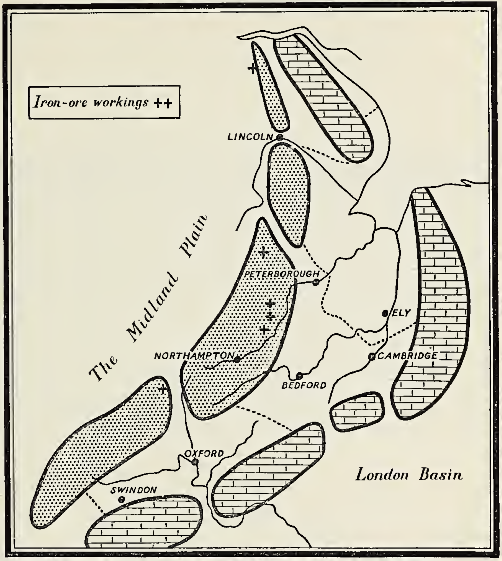
Magdalen Tower
and Bridge, Oxford.


Edge
Lincoln Wolds
Lincoln
R. Witham
THE WASH
The Midland Plain
Fenland
R. Nen
R. Great Ouse
East Anglian Heights
Northampton Heights
Plain of the Great Ouse
R. Cam
A
R. Cherwell
Plain of the Upper Thames
Cotswolds
R. Thames
Chilterns
London Basin
White Horse Hills
B

Plan of the Inner Vale and its Bordering Ridges. The subdivisions and river arrangement, as described in the text, are shown.

is in good order there is no better soil in England for grass or crops such as wheat or beans. The market-towns of the Inner Vale were prosperous from early times. Many naturally became county capitals, and two of them, Oxford and Cambridge, are the homes of our oldest Universities. In recent times some of these market-towns have been found convenient for manufactures. Bedford and Peterborough make farm-machinery. Oxford's "dreaming spires" are now surrounded by spreading suburbs and a great motor works. The city stands in the centre of the Upper Thames Basin, where several river-valleys meet. It is a natural junction for traffic. There is no such natural centre elsewhere in the Vale, for its eastern rivers run parallel instead of meeting. Market-towns, therefore, are found where bridges cross the rivers, or along the dry edge of the Fens.

The largest basin of the Inner Vale sends its rivers through the Fens into the Wash. In Fenland the clay is buried under layers of peat and sand. Dark, rush-fringed pools, peat-bogs

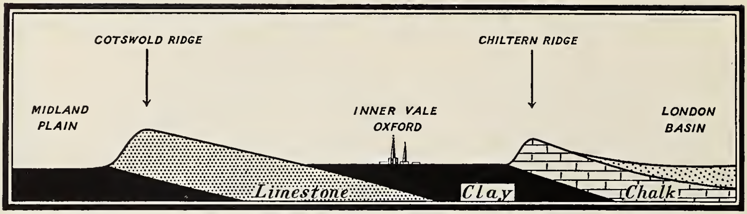

Iron-ore workings ++
LINCOLN
The Midland Plain
PETERBOROUGH
ELY
NORTHAMPTON
CAMBRIDGE
BEDFORD
OXFORD
SWINDON
London Basin

Towns of the Vale. The map shows: (*a*) some market-towns along the firm ground at the edge of the Fens, and along the rivers, (*b*) some ironworks, (*c*) some railway junctions at gaps through the ridges.

and tangled thickets once surrounded the Wash and spread south nearly to Cambridge. These were the natural Fens. The Romans built the first sea walls and grew corn behind them, but their work was forgotten in the savage centuries that followed. A few dry patches alone stood out from a wild and trackless swamp. These islands made ideal retreats for outlaws such as Hereward the Wake, or for monks who only asked to be left in peace. Famous monasteries were founded there, two of which have left us the cathedrals of Ely and Peterborough.

Drainage on a large scale began 400 years ago. The great "Levels" have been reclaimed from the waters, and a barrier of swamp changed into the "Golden Plain of England."

It was not easy to drain the land and get the river water to the sea without letting the tide in. Banks were built round the shores of the Wash, and sluice-gates placed near the mouths of the rivers. These gates, when shut, keep


COTSWOLD RIDGE
CHILTERN RIDGE
MIDLAND PLAIN
INNER VALE OXFORD
LONDON BASIN
Limestone
Clay
Chalk

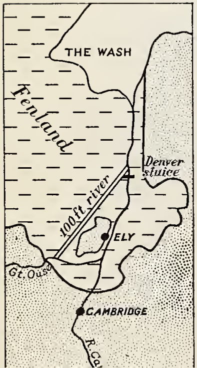
Section, N.W. to S.E. along the broken line on the Plan. The soft clay is worn to a lowland, the harder limestone and chalk stand up as ridges. The tilt of the harder layers of rocks gives short steep edges facing westwards and long backs sloping down gently eastwards.

out the inflowing tide. When the tide falls, the gates are opened and the pent-up rivers pour into the sea.

But that was not all. The great bend of the Ouse near Ely was too narrow to hold flood water. A new channel—two, in fact, were cut across the bend with a space between them to take heavy floods. Modern sluice-gates at Denver control the whole Ouse system. The banks of all the rivers were built higher, and a network of ditches cut to carry the Fen water to the rivers. Windmills were used to lift this water into the rivers. But as the land dried it shrank, and the Fenlands have sunk 18 inches or more. Pumping is more necessary than ever, and steam and oil are found to be more reliable than wind to drive the pumps.

Even so, banks sometimes burst. Very heavy rains may fill the channels, very high tides may keep the sluices shut too long. At such times a constant watch must be kept and weak places strengthened to prevent the low-lying farmlands being drowned again.

Most of Fenland is ploughland: sheep and cows are rare. Crops are very varied and usually heavy. Potatoes and vegetables are grown in great quantities to supply London, and most of our sugar-beet factories


THE WASH
Fenland
Denver sluice
100ft. river
ELY
Gt. Ouse
CAMBRIDGE
R. Ca

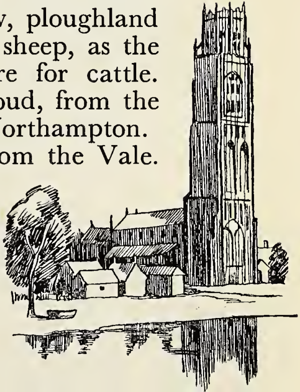
The Great Bend of the Ouse.

The Denver Sluice. The gates are shut down when the tide comes in, to prevent the sea-water filling the Old Ouse and its tributaries; they are opened when the tide goes out, to allow the Ouse water to escape to the Wash.

are in the Fens. Much small fruit is grown, and when the fruit is over, the jam factories turn to tinning vegetables. Tulips and other spring bulbs compete with those sent over from Holland.

On its western flank the Vale meets the gentle slopes of the Limestone Ridge. Surface water is scarce on this soil, and villages lie in the narrow valleys of the streams. Farms often run up from the valley so as to include meadow, ploughland and hill-pasture. The Cotswolds are famous for sheep, as the Northampton Heights and the Nen Valley are for cattle. From the one arose the woollen industry of Stroud, from the others, though much later, the shoe factories of Northampton.

The Limestone Ridge looks very different from the Vale. Stone cottages replace the brick or half-timbered houses of the clays; fields have stone walls instead

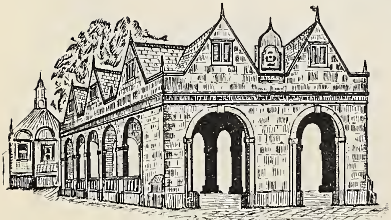


Boston "Stump."

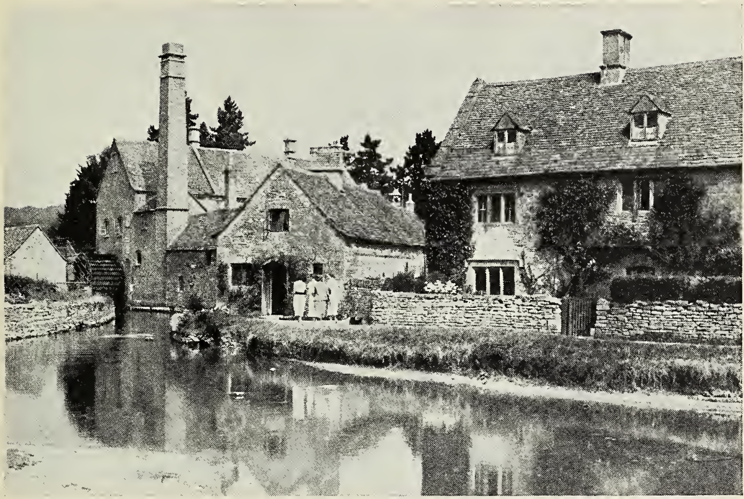
Tulip Fields near Spalding in Lincolnshire. Tulips, hyacinths and other bulbs are produced in large quantities in the Fens and splash the country in spring with bright colours. In the background are dwellings, storehouses and packing sheds. A wind-driven pump for the drains rises behind.

of hedges, and belts or clumps of beeches give shelter from the winds. At intervals from Oxfordshire to the North York Moors open quarries and ironworks spoil the landscape and the villages. But these belong really to the industrial regions we shall reach in later chapters.

The eastern side of the Vale is walled by the steep face of the Chalk Ridge. But the clay runs under the chalk and holds the water that filters through it. Most of this water drains eastward, but enough appears in springs under the western face of the chalk to



Chipping Campden Market Hall.

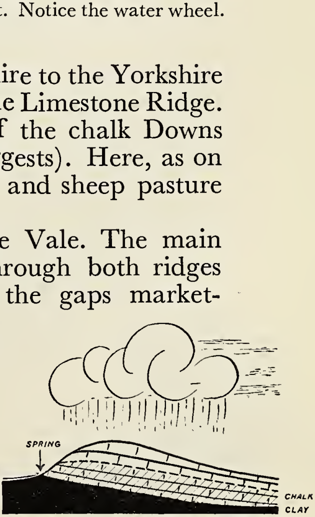


Cotswold Cottages, Lower Slaughter. Villages are set deep in the valleys beside the few streams. The fawn-coloured stone, quarried out in blocks, can be split into thick roofing slats. Since the latter are heavy, walls have to be thick. Most cottages have dormer windows so as to make use of attic space. The garden is enclosed by a " dry " wall. The mill seems to have been recently rebuilt. Notice the water wheel.

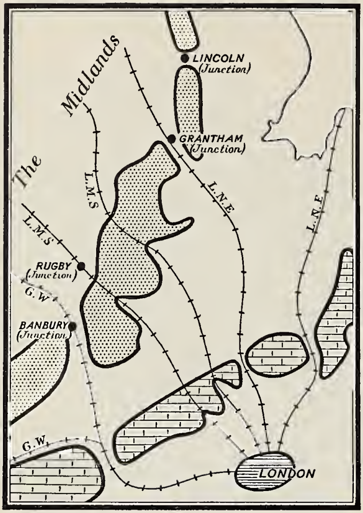
supply a whole series of villages from Wiltshire to the Yorkshire Wolds. A similar line of villages lies west of the Limestone Ridge.

Farms run from the clays to the top of the chalk Downs (which are not so steep as the diagram suggests). Here, as on the western side, cattle pasture, ploughland and sheep pasture can thus be included in one holding.

Few railways run lengthways along the Vale. The main lines to the north run across it, passing through both ridges by natural river-gaps or by tunnels. In the gaps market-towns—Banbury, Rugby and Grantham—have become important railway junctions

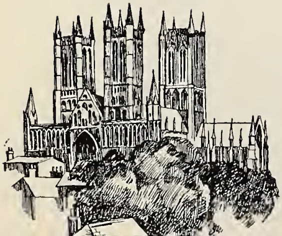


A Spring.

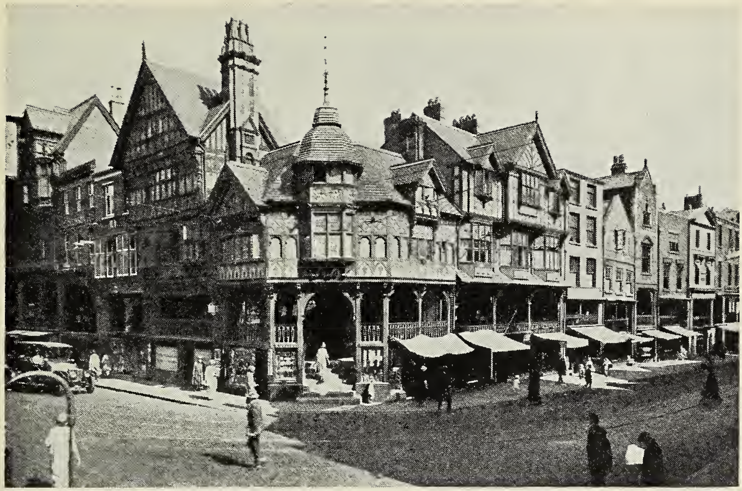

The Midlands
LINCOLN (Junction)
GRANTHAM (Junction)
L.M.S
L.N.E
L.N.E
L.M.S
RUGBY (Junction)
G.W.
BANBURY (Junction)
G.W.
LONDON

Some Main Railway Lines across the Ridges. The Inner Vale has no lengthwise main line of railway. The important routes are crosswise between London on the one hand and the Midlands and north on the other. The dotted areas of the ridges are over 300 feet. Railways make for the gaps and valleys.

and sometimes developed industries of their own such as the great electrical works at Rugby. The meeting of railways and roads at the gaps makes it easy to gather the raw materials and distribute the finished products.



Lincoln Cathedral.

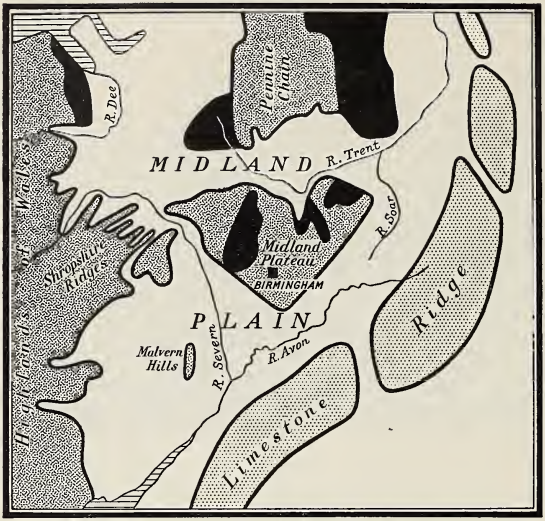


The Rows at Chester. The steps lead up to a second floor of shops, opening on to covered walks. The houses show the half-timber, black and white patterns so frequent in both towns and country of the Midlands.

CHAPTER 24

THE MIDLAND PLAIN

WEST of the Limestone Ridge we reach the Central Plain of England, which stretches to the Welsh Highlands. Its shape is a triangle, but the broad northern end is divided into two arms by the end of the Pennine Chain. So from a centre near Birmingham, its largest city, the Midland Plain throws out three arms to the tidal waters of different rivers. On the north-west it reaches the Dee and the Mersey; on the north-east it follows the Trent, and on the south-west the Severn. Across the centre a broken belt of older uplands pierces the general covering of red sandstone. These are the South Shropshire Hills and the triangular Midland Plateau. Here the


R. Dee
Pennine Chain
MIDLAND
R. Trent
Highlands of Wales
Shropshire Ridges
Midland Plateau
BIRMINGHAM
R. Soar
PLAIN
Ridge
Malvern Hills
R. Severn
R. Avon
Limestone

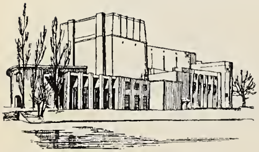
The Midland Plain, its Bordering Heights and Coalfields.

soil is less important than the coal it covers.

The Plain was once a forest region, as scattered woods and copses everywhere remind us. Robin Hood's Sherwood Forest lies in Nottinghamshire and remnants of Shakespeare's Arden in Warwickshire. Most of it is now pasture land cut up by hedges into small fields for cattle and horses.

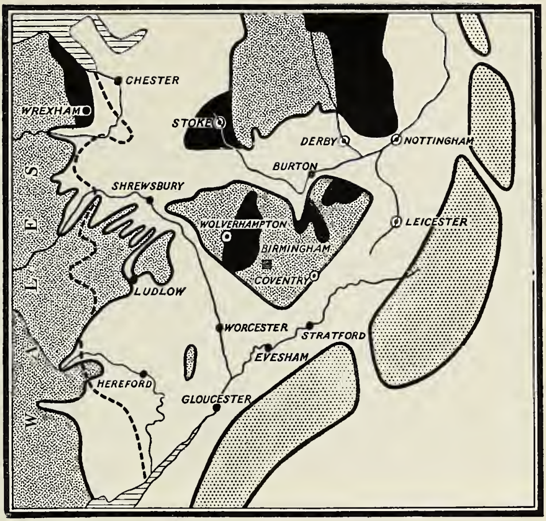
Farming in the north-eastern arm centres in the valleys of the Soar and the Trent, England's third largest river. Fine crops are grown here, but rich pasture is commoner in these clay vales. Here are bred the best hunters outside Ireland. In the spring the graziers also buy " store " cattle from Wales and other parts and fatten them to sell for beef in autumn.

The chief market-towns lie on coalfields. So Leicester and Nottingham produce shoes and stockings and underclothing, as well as the machines that make them. Derby, the meeting-place of all routes round the Pennines, specialises in railway-engines and their rivals, motor-cars. Burton-on-Trent finds its water particularly suited to brewing and makes the casks to store the beer in. Factory chimneys, however, do not cover



Shakespeare Theatre,
Stratford-on-Avon.

the landscape as they do further west, for the local coal is largely sold for household use in other parts of England.


CHESTER
WREXHAM
STOKE
DERBY
NOTTINGHAM
BURTON
SHREWSBURY
LEICESTER
WOLVERHAMPTON
BIRMINGHAM
COVENTRY
LUDLOW
WORCESTER
STRATFORD
EVESHAM
HEREFORD
GLOUCESTER
WALES

The Midland Plain, its Rivers, Industrial Districts and Towns.

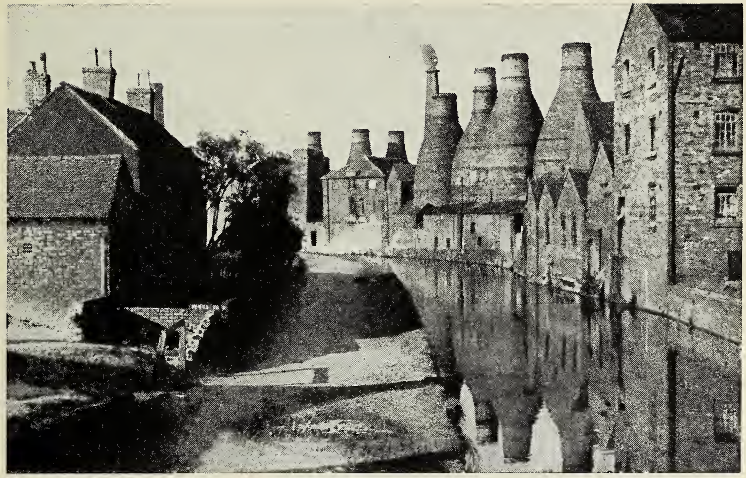
The north-western arm of the Plain includes the Plain of Shropshire and Cheshire. The fertile soil and the needs of the large industrial areas close by encourage dairy-farming, especially in West Cheshire. Coal is found only in a small district round Wrexham in Wales, where grim mining hamlets stand in sharp contrast to the beautiful farm-houses of the English plain. Rock salt is found in underground beds in Cheshire. Fresh water is allowed to settle in it, and the salt is then pumped out in the form of brine. Its removal causes the land to sink, and houses sometimes collapse as a result. Much of the salt is used for making chemicals along the Middle Mersey.

Chester and Shrewsbury, the county towns, lie in loops of the Dee and the Severn. They are the doorways to North and Central Wales and the junctions of many routes. Chester Cathedral, with its picturesque " Close," and the famous " rows " of shops designed for defence against Welsh marauders make it one of England's most interesting towns.

Ludlow Castle. The castle was placed on a defensive hill-top to protect the border country from raids by the Welsh down the valley of the Teme. The river and its valley are seen on the left.

The south-western arm tapers to the Severn Estuary. Herefordshire is famous for its cider-orchards, and its hop-gardens are second only to those of Kent. Its red cattle with white faces are widely bought for " stores," which are fattened for market and supply at last the figures for the " fat-stock prices " of the B.B.C.

The border districts between the Welsh Highlands and the English Lowlands have seen many struggles between the two nations. Today they meet at market in Ludlow and elsewhere, and the whitewashed cottages of the Welsh lie beside the black and white " half-timbered " dwellings of the English. The Shropshire Hills are outposts of the Welsh mountains, and English habits and speech follow the river-valleys west-

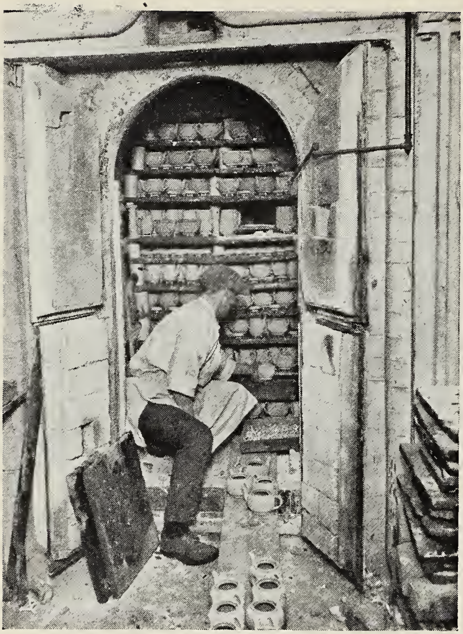


In the Potteries (1): The bottle-shaped buildings on the right are ovens in which the pottery is baked to make it hard. The canal brings china clay from Cornwall which comes by sea to the Mersey Estuary. Such peaceful scenes are rare.

ward into Wales. Only the long rampart of Offa's Dyke, the remnants of town walls and ruined castles recall the troubled past.

Climb from the rolling irregular country of Herefordshire to the summit of the Malvern Hills and you will see the Severn flats and the distant Vale of Evesham. A land of dairies, orchards and market-gardens lies below you, with picturesque houses and many woodlands. Worcester and Gloucester, with their markets and cathedrals, lie on the Severn; Shakespeare's Stratford, and Evesham with its plums and pears, on the Avon. Beyond rises the long limestone edge of the Inner Vale.

The smaller coalfields do little to destroy the countryside, but on the Midland Plateau it is otherwise. Here in the centre



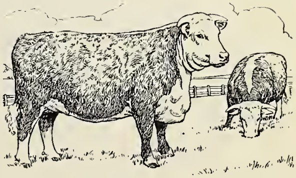
In the Potteries (2): The inside of the oven is being packed with tea-pots and jugs at the Wedgwood factory. The doors will be tightly closed and the pottery baked for several days.

of the Plain lies the Black Country — less black now, perhaps, than it was fifty years ago, for it is doing its best to repair its old mistakes.

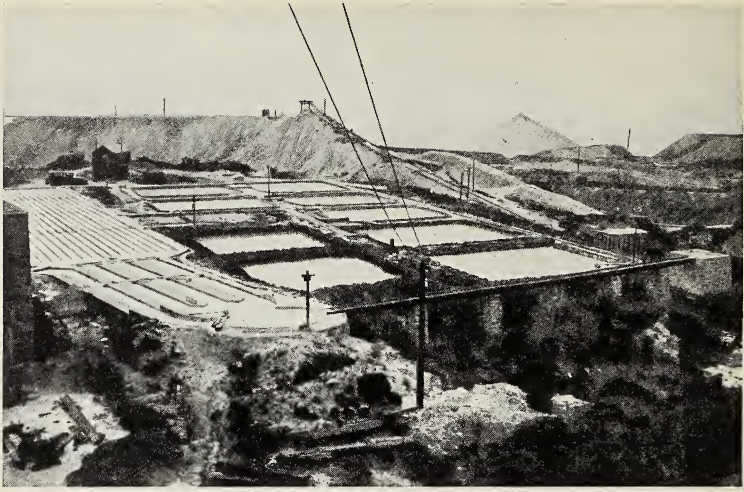
Coal and iron were found together in South Staffordshire, and a hive of industry developed above ground and below. Little thought was given to anything else. Pithead gear and blast-furnaces sprang up on all sides, and heaps of their rubbish covered the green fields. Factory chimneys and railway-sidings, noisy streets and crowded slums replaced the quiet woods and pleasant villages.

Local supplies of coal and iron are now almost exhausted. The coal now comes from further north, the iron from the Limestone Ridge. But the skill of the local workmen is handed on from father to son, and still finds employment in heavy engineering and ironmongery or the newer "light" engineering. The Black Country now makes motor-cars and cycles and an infinite variety of other things from electrical apparatus to artificial silk; for these depend on the high skill of the workers. Between Birmingham with its million inhabitants and Wolverhampton the busy towns lie cheek by jowl. Birmingham, the industrial capital of the Midlands, is a great railway and canal junction.

North of the Plateau another dense population occupies the North Staffordshire coalfield. Here lie the " Five Towns " of the Potteries, now one city under the name of Stoke-on-Trent. They make all kinds of earthenware, from the coarser pots baked from the local clay to the finer porcelain made of china clay imported from Cornwall and other sources. The shaping of clay ranks, for the beauty and delicacy of its best products, as a fine art. But the beehive pot-ovens of the Five Towns are as unlovely as the blast-furnaces of the Black Country, and their surroundings belong very plainly to an industrial region.



Hereford Cattle.



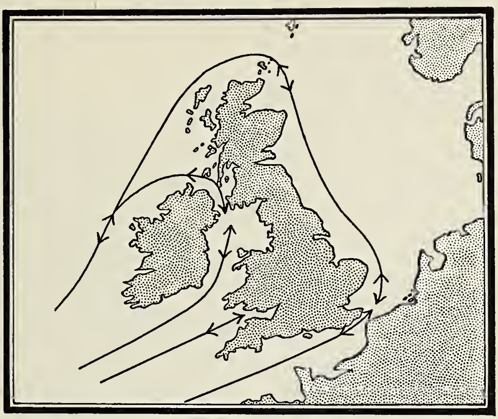
China Clay, St. Austell, Cornwall. The china clay is dug from decayed granit and cleaned as here shown. The troughs on the left refine or take the fine sand ou of the liquid clay before passing it to the settling pits on the right. From the latte the liquid clay is sent through underground pipes to large stone tanks, where i thickens. When of the right thickness, it is dried off in kilns and is ready for shipment.

CHAPTER 25

DOWN CHANNEL

THE Bristol and the English Channels enclose a lon peninsula which divides the approach from the Atlanti into two main seaways, of which the English Channel is th more important. It leads to Southampton, London and all th ports of Northern Europe. The other route leads to the port of the Irish Sea and the Bristol Channel.

The tidal water rolling in from the Atlantic is also split b this Cornish wedge. Twice a day it surges round our islands The main tide laps the western coast of Ireland and Scotland

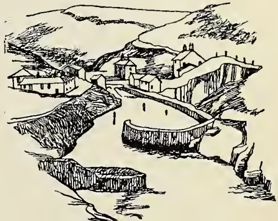


Tidal Currents round the British Isles. It is high water at Dover, Liverpool and in the Moray Forth, for instance, at the same time of day.

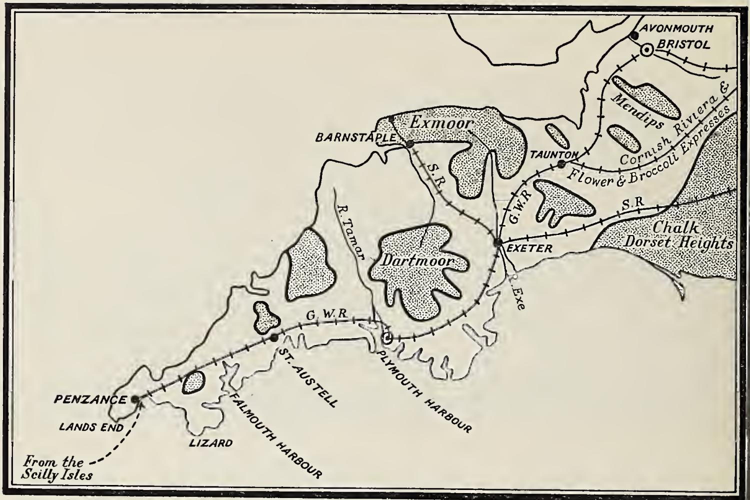
sweeping on towards Norway and round into the North Sea. The rest, split first by Land's End and then by South Wales, rolls through St. George's and the English Channels and sends a central wave to fill the Severn Estuary 30 to 40 feet above low-water level. And twice a day the ebbing tide empties the swollen rivers of all but their own waters, and leaves banks of mud or sand to harass sailormen and delight the gulls.

In South-West England the limestones, sandstones and granites are harder, the scenery more rugged than on the "whale-backed" ridges of the Cotswolds and the Downs. We find irregular stretches of broad, open uplands gashed by deep, wooded "combes," which often lead to winding inlets of the sea. These river-mouths, as at Plymouth, Falmouth and Bideford, have been great nurseries of English seamen. The coast is a series of broad, sweeping bays running out to rocky headlands, landmarks for ships as they pass up to port, or outwards to the ocean.

The sea is never far away, and fishing should flourish on these coasts. But the trade is now mostly carried on by a few distant ports, like Grimsby, which lie nearer the centres of population. The decay of local fishing is serious, for in the past our navy and merchant service



A Cornish Cove.


AVONMOUTH
BRISTOL
Mendips
Cornish Riviera &
Flower & Broccoli Expresses
Exmoor
BARNSTAPLE
TAUNTON
S.R.
G.W.R
S.R
Chalk
Dorset Heights
R. Tamar
Dartmoor
EXETER
R. Exe
G.W.R.
ST. AUSTELL
PLYMOUTH HARBOUR
PENZANCE
LANDS END
FALMOUTH HARBOUR
LIZARD
From the Scilly Isles

The South-Western Peninsula, showing the hill masses, railway routes, and important towns.

have found their best sailors among the brave and skilful fishermen of the little harbours, which now have difficulty even in manning their own lifeboats.

Mining has also diminished in the west. The tin and copper mines of Devon and Cornwall cannot compete with supplies from abroad. But excellent china clay is won from decayed granite near St. Austell. The towering white clay-dumps stand out as gleaming landmarks on the moors. The clay is exported to our Potteries and the United States. It makes the best porcelain, but even more is used for adding smoothness to cloth and paper. Coal is found only in North Somerset, where the collieries supply the tobacco and chocolate factories of Bristol. These local manufactures began in the days of Bristol's slave-trade, for the slavers, after delivering their

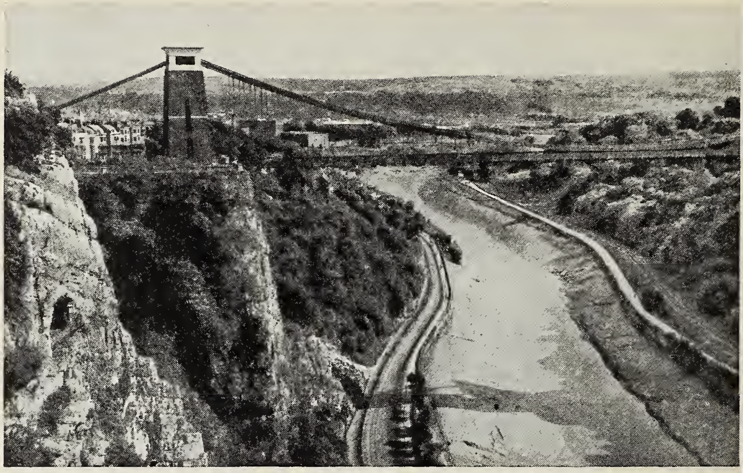
Dartmoor Ponies. A round-up of ponies and their foals on Dartmoor.

unhappy cargoes in America, shipped the tobacco and sugar to fill their empty holds. The American trade of this great port now includes grain and bananas.

Central Somerset is a low coastal plain, a series of fen-like flats. Willow-bordered "rhines" or open ditches divide the rich pastures and the peat. Sea walls protect the "levels" from the tide, and the villages lie on "islands" of higher ground, or on long hill-ridges that divide the flats.

North of this district the Mendips, a flat-topped mass of mountain limestone, stretch nearly to the sea. The water sinks through "swallet-holes" to underground rivers, which escape through caverns, such as Wookey Hole, on the southern face. The Cheddar Gorge was probably one of these (see page 399).

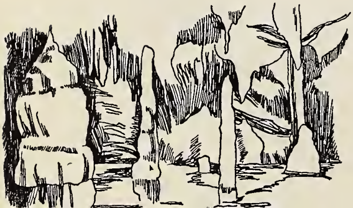
To the south of the levels the Vale of Taunton opens the



The Tidal Avon at Bristol. The low tide leaves only a small stream flowing between wide mud-banks. At high tide ships can reach Bristol (beyond the bridge), but the windings of the river prevent large boats ascending. The river is here flowing through its deep limestone gorge with barely room for the road and railway which run to Avonmouth. The gorge is spanned by a suspension bridge.

road to Devonshire through the hills that rise westward to the crown of Exmoor. Half Exmoor and all Dartmoor lie in Devonshire. The slate of Exmoor and the granite of Dartmoor hold water in every hollow, and swamps and peat-bogs cover much of the surface. Grassy slopes yield pasture for sheep and wild ponies, and wide stretches of heather cover the higher ground. A similar granite moorland region forms the backbone of Cornwall.

In farming, the three counties follow different lines. Somerset is near enough to London to send daily supplies of milk. Cornwall, however, must turn it into butter or, like Devonshire, into clotted



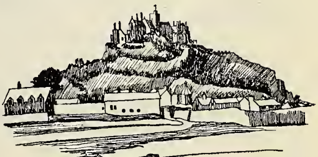
Stalactites and Stalagmites in Wookey Hole.

Early Flowers in the Scilly Isles. Masses of early narcissus in the open are being picked for despatch to Penzance for London. The rocks are of granite.

cream. Otherwise Devon cattle are mainly bred for "stores" to be sent for fattening to pastures nearer the great cities. The apple orchards of Somerset and Devon yield excellent cider.

Beyond Bristol there are only two large towns. Exeter, a cathedral city, is the junction of the railways and most of the roads of the west; for Exmoor and Dartmoor and the estuary of the Exe leave little chance of passage otherwise. Plymouth owes everything to its fine harbour and the naval dockyards of its neighbour, Devonport; but the port lies too far west for much commercial use.

Behind the River Tamar the people of Cornwall lived long apart, the descendants of a Celtic race like those of Wales

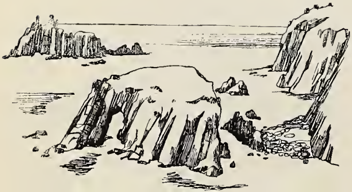


St. Michael's Mount.

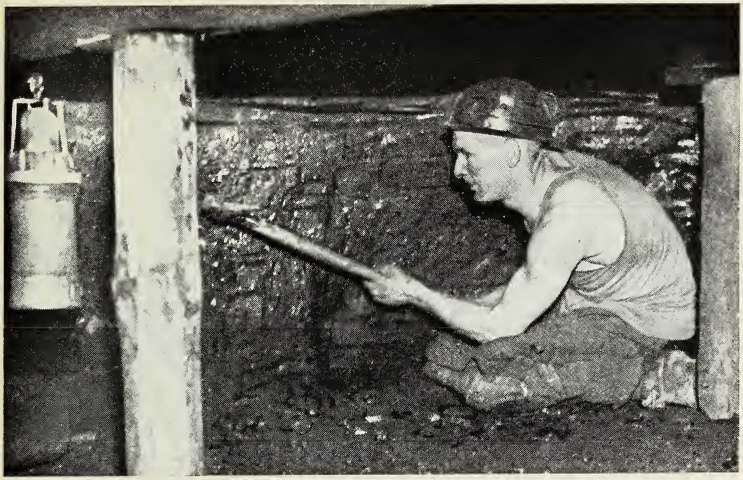
and Brittany and speaking a similar language still traceable in many names. "By Tre, Pol and Pen you can tell the Cornishmen" and also their original homes.

Two great railways opened up the country, threading their way round the hills, and holiday-makers soon discovered its attractions. This narrow peninsula, washed by two warm seas, has many delightful beaches and sunny winter resorts such as Penzance and Torquay. Snow is rare in Cornwall and South Devon, and there is a big trade in spring flowers and early vegetables.

Even more fortunate in their climate are our island outposts, the Scillies and the Channel Islands. The Scilly Isles beyond Land's End send daffodils and asparagus across the stormy seas before the mainland produce is ready. The Channel Islands, the last remnant of English Normandy, lie in a bay of France. Jersey is the largest, and all its land slopes to the sun. It grows early potatoes in open fields and on every valley side. Guernsey, which slopes north, catches the sun in countless glass-houses, where grapes and tomatoes are chiefly grown. Both islands are famous also for their breeds of dairy cattle, delicate deer-like animals, which give the richest milk.



LAND'S END.



Coal-mining (1): A Coal-Miner at Work. By the light of the safety lamp he is working at the coal-face. Why does he work in a crouched position? Why is he almost stripped to the waist? How does he get pure air to breathe? Why does he wear a tin hat and leather knee-caps? What is the pit-prop for?

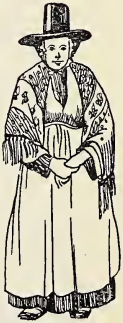
CHAPTER 26

WALES

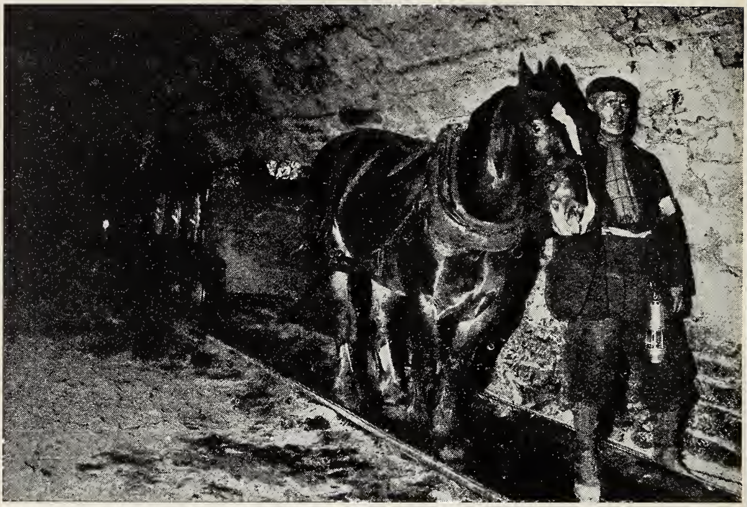
Eu Nêr a folant; eu hiaith a gadwant;
Eu tir a gollant, ond gwyllt Walia.

Their Lord they shall praise, their language they shall keep,
Their land they shall lose, except Wild Wales.
Taliesin (*Early Welsh Poet*).

THE wildness of Wales saved it when our barbarous English ancestors overran this island, for many of the Britons who survived retreated into its mountains, where the



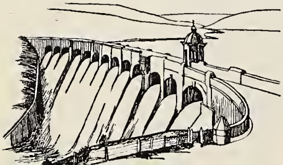
Welsh National Costume.



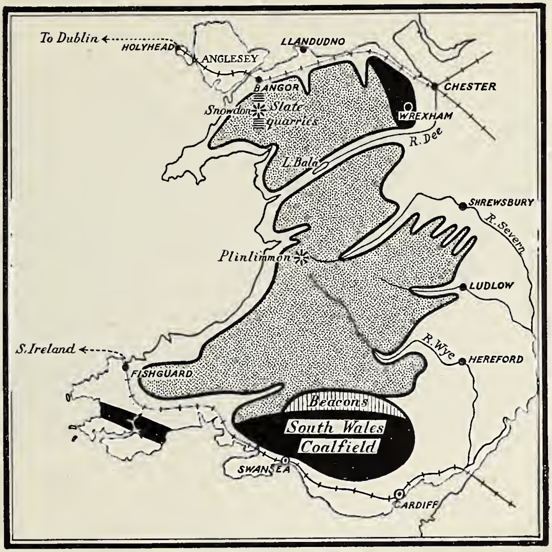
Coal-mining (2): Underground. Pit ponies (with stables underground) are used for hauling the trucks from the coal-face to the lifts at the shaft, often over long distances. The miner has his safety lamp.

invaders had no desire to follow them. So, as in Cornwall, the British fugitives beyond the Severn lived to praise the Lord, of whom the English as yet knew nothing, and keep their language, which we call Welsh. The fertile plains of England were lost to them, but among their mountain fastnesses they were, for a time, secure.

Wales is a high land, except for the island of Anglesey, the two western peninsulas and southern Glamorgan. Snowdon is over 3,500 feet and the Brecknock Beacons are nearly 3,000. The tough old rocks are more valuable for the slate and the coal they contain than for the thin soils and scanty sheep pasture that overlie them.



Craig Goch Dam and Reservoir,
Birmingham Waterworks.

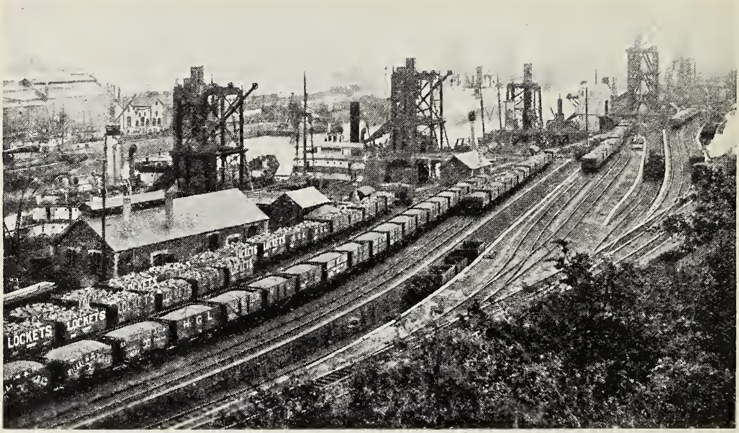

To Dublin
HOLYHEAD
ANGLESEY
LLANDUDNO
BANGOR
CHESTER
Snowdon
Slate quarries
WREXHAM
R. Dee
L. Bala
SHREWSBURY
R. Severn
Plinlimmon
LUDLOW
R. Wye
HEREFORD
S. Ireland
FISHGUARD
Beacons
South Wales Coalfield
SWANSEA
CARDIFF

Wales. The highlands are shaded; the coalfields of North and South Wales and some slate quarries are shown. The high block is divided by deep valleys, which lead down to the English Plain. The main line railways marked along the north and south coasts not only serve those regions but also lead to Ireland.

The heavy rainfall feeds many rivers, which have deeply trenched the moorlands. These rivers are useful in providing water and in offering valley-ways through the mountains. The Dee rises in Bala Lake, and the Severn under Plinlimmon. Distant cities have dammed their tributaries to form reservoirs. Pipe-lines carry water to Liverpool and Birmingham—in each case a journey of about seventy miles.

It is easier to travel down to the sea and along the coasts, or down the broader valleys to the English Plain, than across the inner highlands. So the people of North and South Wales have lived much apart, and differences of employment and ideas, in modern times, have kept them separate.

The coasts have provided the easiest approaches from England, as the railways were quick to discover. Wales, moreover, bridges half the distance from England to Ireland.



Coal-mining (3): Train-loads of coal at the Penarth Docks, near Cardiff. The photo shows the marshalling sidings, the coal-shoots and ships being loaded. Why is the truck at the end of the left-hand train turned at right angles? Where have the empty trucks come from, and why the slopes on the sunken lines? Describe the story of a truck from the loaded train to the sunken siding.

The Holyhead route is the shortest way to Dublin, and from Fishguard in Pembrokeshire boats run to the southern Irish ports.

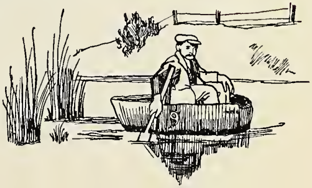
Along the north coast the railway has opened up a string of seaside towns, such as Llandudno and Colwyn Bay, which are much visited by people from the Midlands and the North of England. Many also are attracted by the fine scenery of the Snowdon region. Industries centre mainly on the coalfield round Wrexham on the skirts of the Midland Plain of England. The quarries between Bangor and Snowdon provide most of our slate.

Just as North Wales looks to Lancashire and the Midlands, so South Wales looks out to sea. The excellence of its coal and the position of its mines so near the shores of the Atlantic have made South Wales the greatest coal-exporting region of the world.

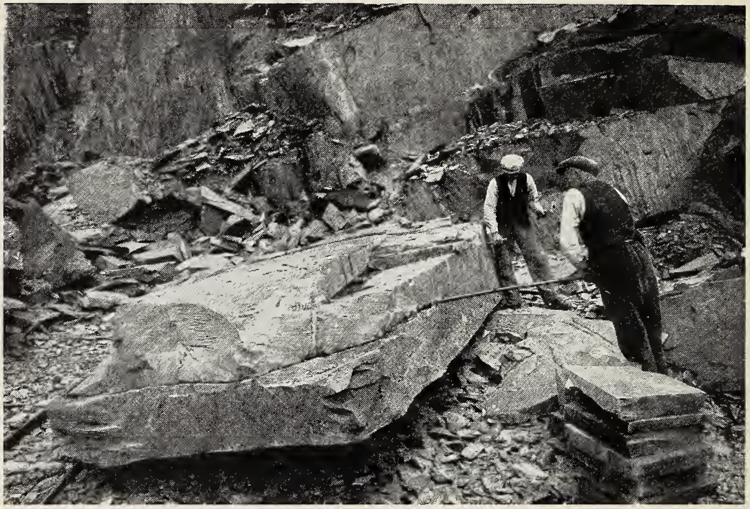
The nature of the coal-beds changes as one goes west. Flaring, tarry coal is mined in Monmouthshire and East Glamorganshire. This is most useful for open fires and the making of gas. Round Swansea a harder, " smokeless " coal is found, the best with which to fill the fuel " bunkers " of steamships, or their holds for export to coaling-stations abroad. Behind this, and in the narrow Pembrokeshire coalfield, anthracite is got. This is the hardest kind of coal and is used mainly in stoves, as it burns slowly and gives out great heat.

All these kinds are exported. The coalfield lies among the mountains, but fortunately many deep valleys cross it and lead down to the Bristol Channel. Where the valleys meet near the sea, coal-exporting ports have arisen. The greatest of these is Cardiff, which ships more than half of all the coal exported from South Wales. But it is not only coal that goes abroad. Iron ore from Spain and elsewhere is brought to South Wales and largely employed for two widely used products. Both are made by coating one metal with another to protect it from rust. Thin sheets of steel are dipped in molten tin to make the familiar " tins " in which food and other things are preserved. By the other process, iron or steel is coated with zinc to make what we call galvanized iron. This is best known to us in the useful but unattractive forms of barbed wired and corrugated iron. The centre of these industries is Swansea, which also refines great quantities of foreign petroleum.

The coalfields and steel industry have drawn many people from the country to the towns. The coal is chiefly mined in narrow valleys where the houses are very cramped for room and open spaces usually impossible. The towns, moreover, are separated by high barren moorlands. The absence of other trades to turn to in bad times, and the difficulty of moving from one town to another in search of work,



Welsh Fisherman in his Coracle.



A Slate Quarry in North Wales. Quarrymen are reducing large slate blocks into sizes suitable for splitting and cutting into roofing slates.

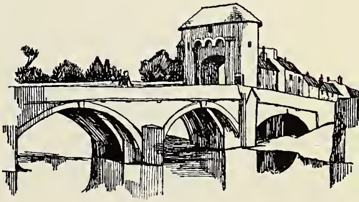
have been serious misfortunes to South Wales. There is little to tempt men back to the farms, even if they could forsake the habits of town life. Farming in Wales suffers from the heavy rain that the mountains bring down and from a none too fertile soil.

The black cattle, however, are prized by English graziers, who buy " Welsh runts " for fattening. Sheep are also profitable, especially the mountain breeds. Modern taste in mutton agrees with the opinion of the old Welsh raiders, though not with their choice:

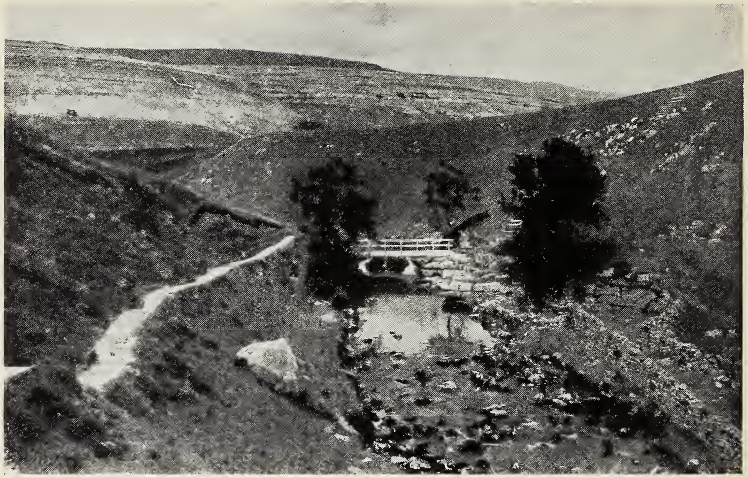
The mountain sheep are sweeter,
But the valley sheep are fatter:
We therefore deemed it meeter
To carry off the latter.

The small mountain sheep produce the best meat, the lowland sheep the best wool. Exposure to such heavy rain as falls on the Welsh hills encourages in the course of centuries a hairy quality in the short wool, which helps to throw off the wet but reduces its value for human clothing. On the other hand, the easy feeding of the valley pastures is apt to make the mutton coarse and fat, while the wool grows thick and long.

The Welsh are a smaller and darker people than the English. They are renowned for their love of music. Their yearly competitions in music and literature called (or rather, spelt) *Eisteddfodau* are very popular and help greatly to preserve the Welsh language. Most Welshmen speak both Welsh and English, but there are thousands of people, especially in the lonelier valleys of the west, who know no English.



Monnow Bridge, Monmouth, and its Fortified Gate.

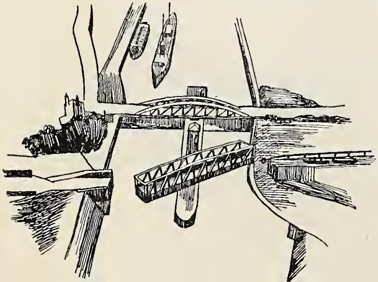


North Pennine Moors. Find out from the map on page 461 of what rock these grassy moors are composed. The stream (Kingsdale Beck, near Ingleborough), fast and boulder-strewn, has cut a deep valley or dale. Much grey rock protrudes through the thin soil cover. Along the flanks of the dale the strata are seen to be nearly horizontal and to drop by terraces with steep edges or "scars."

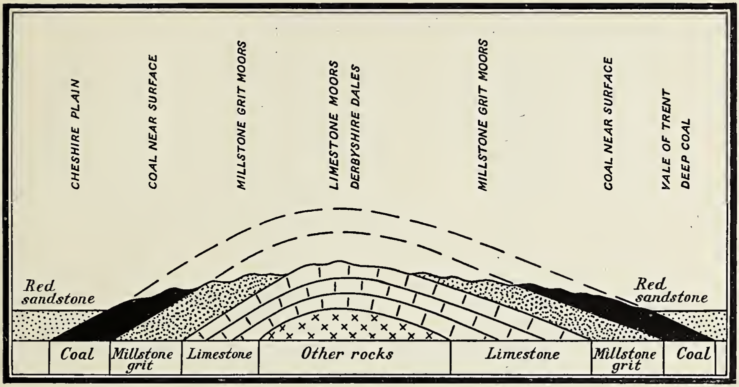
CHAPTER 27

THE PENNINES AND THE NORTH-WEST

THE Pennine Chain stretches like a backbone to England for 170 miles from Derby to the Scottish Border. Two pairs of coalfields lie upon its flanks with lower plains beyond them. Their names and positions will be most easily remembered if you look at the diagrams. Rivers flow west and east from the high Pennine Moorland, and in two places a pair of these rivers actually divide it. The Tyne and Aire gaps (so called from their longer eastern rivers) divide the Chain into three blocks: the



Barton Bridges, carrying the Road and the Bridgwater Canal over the Manchester Ship Canal.


CHESHIRE PLAIN
COAL NEAR SURFACE
MILLSTONE GRIT MOORS
LIMESTONE MOORS
DERBYSHIRE DALES
MILLSTONE GRIT MOORS
COAL NEAR SURFACE
VALE OF TRENT
DEEP COAL
Red sandstone
Red sandstone
Coal
Millstone grit
Limestone
Other rocks
Limestone
Millstone grit
Coal

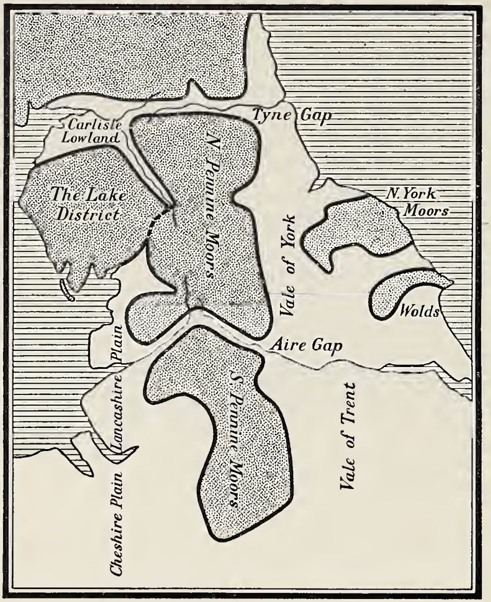
Section across the Southern Pennines. The crest of the original arch of rocks has been worn away. Over much of the centre even the lowest layer (limestone) is now exposed (in the North Pennines and Derbyshire). Coal-bearing layers remain only on the two margins; east and west they sink rapidly under the red sandstone rocks of the lowlands. Heights are exaggerated.

Cheviot Hills, the North Pennine Moors and the South Pennine Moors.

Most of the Northern Pennines are made of hard, grey limestone. The same rock appears again in the Peak District of Derbyshire, but most of the Southern Pennines are of a hard sandstone called millstone grit.

Differences of scenery reveal the different rocks. The limestone quickly absorbs water. Streams sink into the ground to hollow out caves and appear again in steep-sided dales. The surface is dry, craggy moorland, or even bare rock. The millstone grit lets little water through. Its moors are heather-covered, with peat-bogs in the hollows. The grit gets its name because it is hard enough to be used for millstones. Its soft, lime-free water is valuable for the industries of the neighbouring coalfields, as we shall shortly see. The Pennine Moors feed sheep and shelter grouse, while the lower dales breed

Grouse.


Carlisle Lowland
Tyne Gap
The Lake District
N. Pennine Moors
N. York Moors
Vale of York
Wolds
Aire Gap
Lancashire Plain
S. Pennine Moors
Vale of Trent
Cheshire Plain

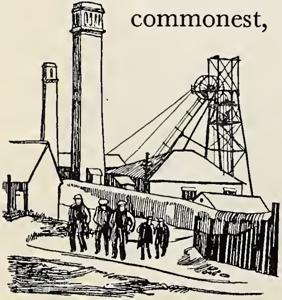
Northern Highlands and Lowlands. The Tyne and Aire gaps divide the Pennines into three blocks. The Lake District is attached to the central block. These moorlands are flanked by lowlands, whose names are given.

young cattle for the lowland pastures. Farms are scattered and the population small, though many visitors come in summer to enjoy the bracing air or to shoot grouse in autumn.

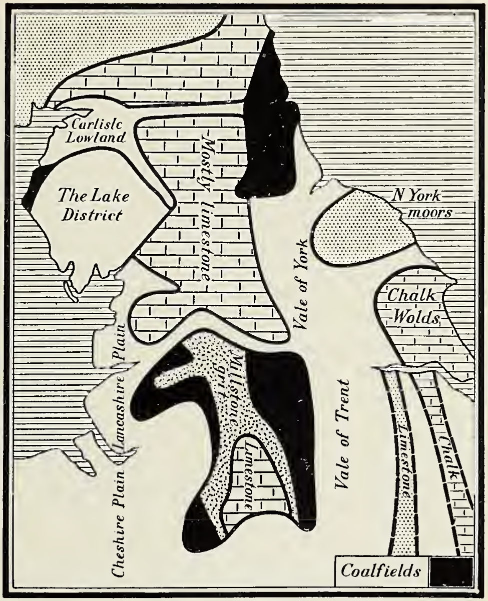
Below, on the coalfields, winding-gear, pit-heaps and tall chimneys surround you. Mines, mills and weaving-sheds, railways and endless rows of houses cover the land, and the remnants of the countryside are blackened with the smoke.

Beyond these regions are the lowlands. On the wetter side, from Cheshire northwards to the Solway Firth, grasslands are mostly seen; on the sheltered, drier east, more land is ploughed. But fodder crops used to fatten cattle for the butcher are commonest, and on either side of the Pennines dairy and poultry farms and market-gardens supply the populous areas.

The Lake District is separated from the Pennines by the Eden Valley and joined to them



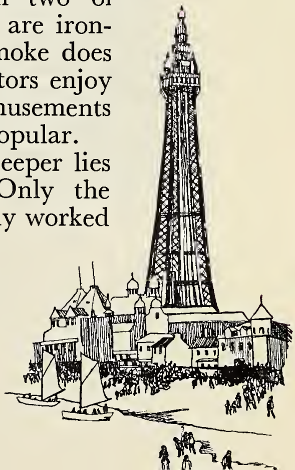
Pit-head Winding Gear.


Carlisle Lowland
The Lake District
Mostly limestone
Vale of York
N York moors
Chalk Wolds
Lancashire Plain
Millstone grit
Limestone
Vale of Trent
Limestone
Chalk
Cheshire Plain
Coalfields

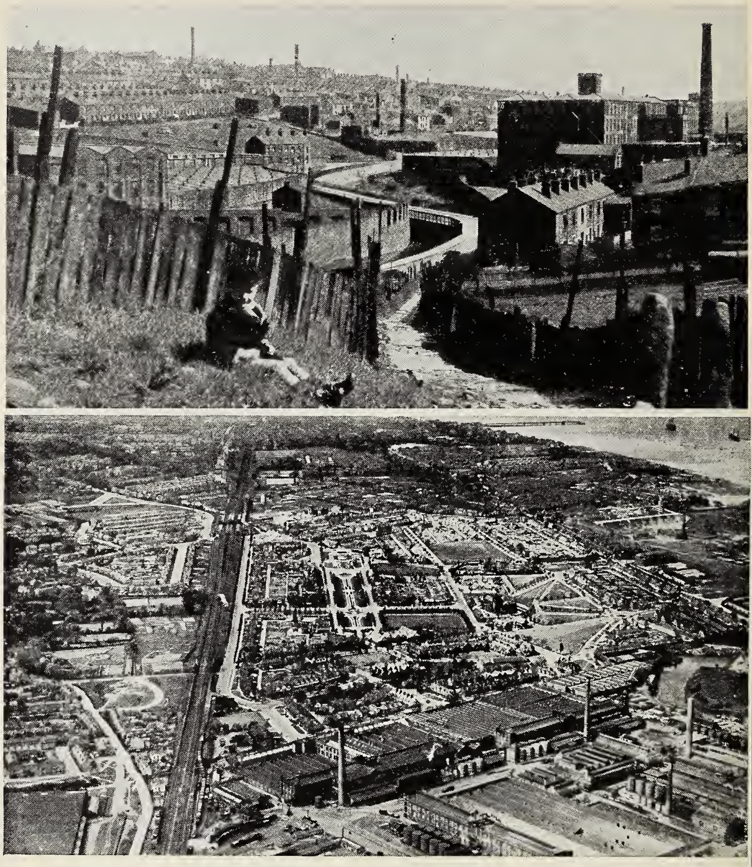
Rocks of the Pennines. The northern blocks are chiefly limestone; the southern block is mostly millstone grit, but in the very south the underlying limestone is exposed and forms the district of the Peak and the Derbyshire Dales. The coalfields lie on the west and east flanks in pairs.

by Shap Fell. Its scattered farms, with sheep on the fells and cattle in the dales, remind one of the Pennines, but its scenery is far finer. The rivers flow through deep valleys from the heights of Scafell or Helvellyn. Most of the valleys contain long lakes, such as Windermere, from two of which Manchester draws a water-supply. There are ironworks on the Whitehaven coalfield, but their smoke does little harm to the mountain scenery. Many visitors enjoy the peaceful beauty of the Lakes, though the amusements of Blackpool and the Isle of Man are still more popular.

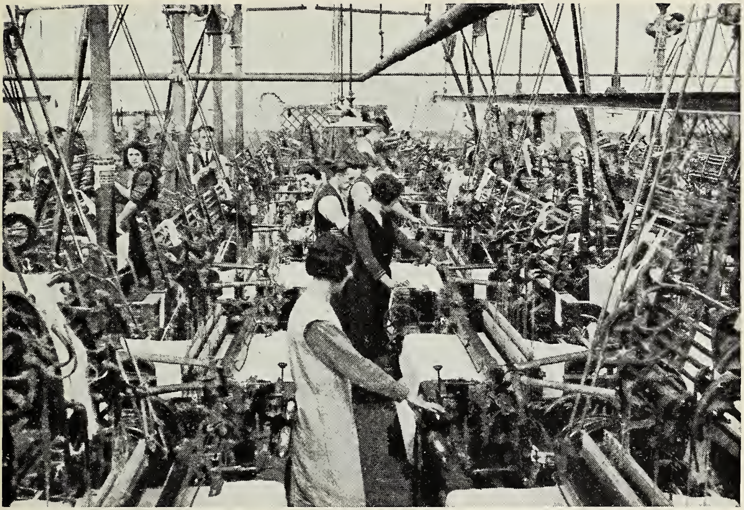
The further you go from the Pennines, the deeper lies the coal and the more costly it is to mine. Only the profitable seams are worked, and some are already worked out. The northern mines supply about a tenth of the 15 million tons raised yearly; the rest comes from the Wigan and Manchester districts.



Blackpool Tower.



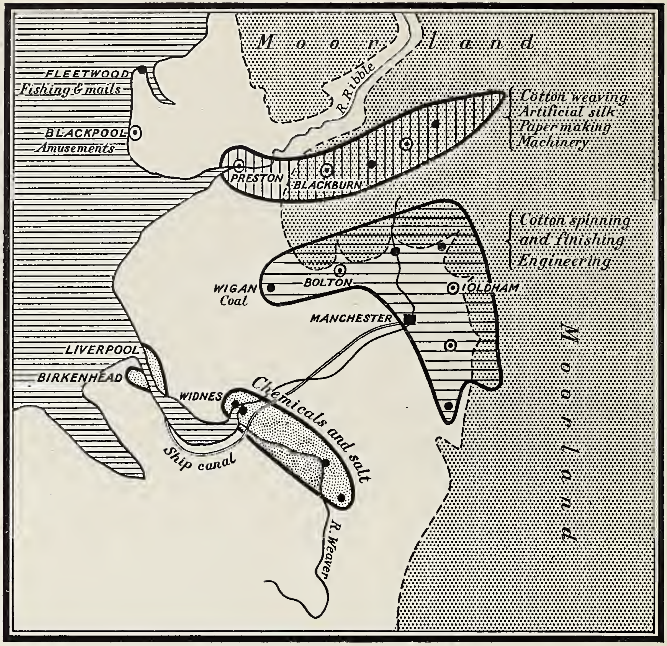
A Contrast in Town-planning. The upper picture is a cotton town in North Lancashire. Dwellings are in monotonous rows, varied only by mill chimneys. There seems little room for gardens, and the fences are unsightly. The lower picture is of Port Sunlight on the Mersey Estuary. The soap factories at the bottom are outside the town; houses are spaced out; gardens, lawns and trees are present everywhere.



Cross-rod Looms in a Lancashire Cotton Mill. The warp threads are coming through the machines from the back. Their up and down movement is controlled by the " healds," seen hanging by cords from the framework of cross-rods. On both sides of the machine are mounted " picking sticks," which send the shuttle backwards and forwards across the warp threads 180 times a minute. Spare shuttles are on the stand close to the girl's hand. As the cloth moves on, it is wound on the roller underneath. Usually one operative manages four machines.

But Lancashire uses so much coal that she needs to bring supplies from Yorkshire, for the industrial towns lie thick. Indeed, they are almost continuous over a thirty-mile belt of South Lancashire.

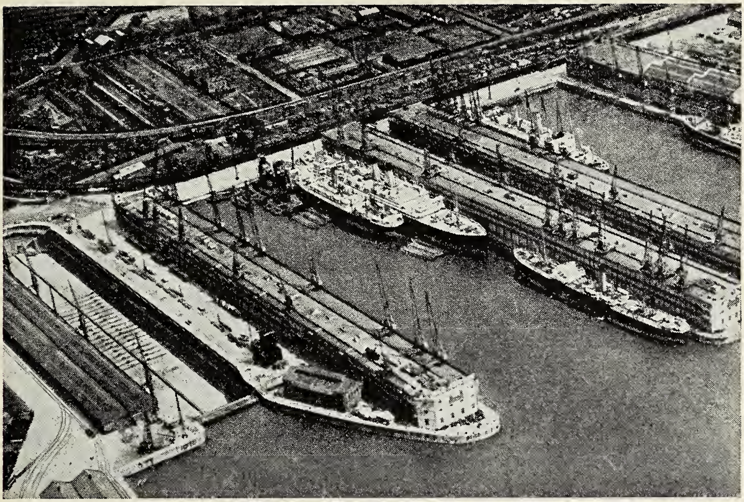
The main sea-entrance is by the Mersey and the port of Liverpool. Like Bristol, Liverpool did well in the slave-trade. From it, began her traffic in West African oil products, West Indian sugar and American cotton and tobacco. She has, of course, a great passenger traffic and many other lines of business, including American wheat and petroleum and Irish meat. She exports the


Moorland
R. Ribble
FLEETWOOD
Fishing & mails
BLACKPOOL
Amusements
PRESTON
BLACKBURN
Cotton weaving
Artificial silk
Paper making
Machinery
Cotton spinning
and finishing
Engineering
WIGAN
Coal
BOLTON
OLDHAM
MANCHESTER
Moorland
LIVERPOOL
BIRKENHEAD
WIDNES
Chemicals and salt
Ship canal
R. Weaver

The North-Western Industrial Groups. The three great groups are shown—North Lancashire, South Lancashire, and the Mid-Mersey chemicals and salt. Only towns mentioned in the text are named; find others in the atlas.

products of Lancashire and of West Yorkshire too. The Mancheste Ship Canal, however, which brings ocean vessels direct from th Mersey Estuary to Manchester, has made that city her serious rival.

In early days the spinning and weaving of wool gav employment on both sides of the Pennines. It was contact with America that made Lancashire a cotton factory. Before coal replaced water-power, the moorland streams turned her millwheels. Her moist air helped to prevent the snapping of th



Liverpool Docks. The Mersey is a tidal river, so that a concrete wall runs parallel with the shore and shuts in the basins which are entered through lock gates. Projecting quays with cranes and warehouses increase the berthing space. Passenger and cargo boats are alongside with barges or lighters full of needed coal. The docks extend for nearly seven miles; and behind runs a road and an " overhead " railway.

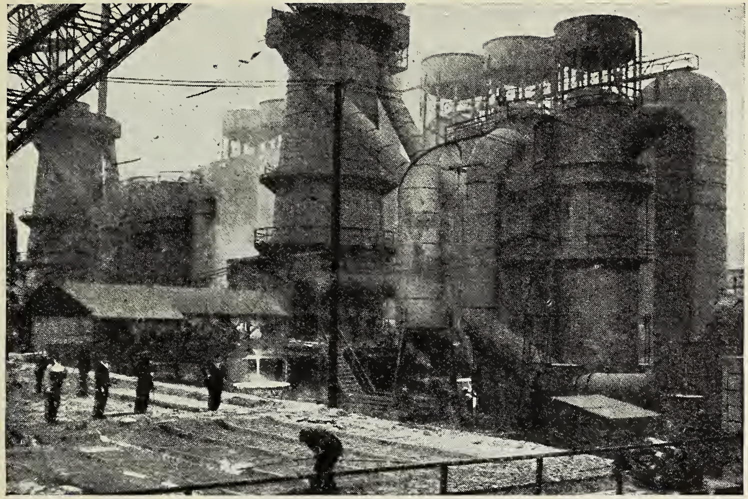
cotton-fibres before damping devices were introduced. The soft water from the millstone grit saves soap and leaves no lime deposit in boilers. All these advantages were hers, but much is also due to the inventiveness of her people.

The various stages in the making of cotton goods are as a rule carried on in different districts. The raw cotton landed in Liverpool or Manchester comes chiefly from the southern United States, but the longest and silkiest cotton lint is grown in Egypt. It goes first to the spinners of Oldham and other towns near Manchester to be twisted into thread or " yarn." Most of the yarn is then sent north to be woven into " grey cloth " at Preston, Blackburn or elsewhere.

Grey cloth must be washed and either bleached white or dyed in colour. Soft water, soaps and chemicals are needed for this. Pennine streams supply the water, whilst the soap and chemicals come from the towns of the Lower Mersey. Port Sunlight and Warrington make much of the soap and Widnes much of the chemicals. The necessary salts in each case come from the Cheshire Plain, and the other materials are imported by way of the River Mersey.

In the " finishing " processes that are still necessary, Manchester and Salford play a large part. It is the Manchester merchants who sell most of the cotton goods to buyers at home and abroad. But the lead of Lancashire in the world's cotton trade has suffered severely from foreign competition. America and Europe have long learnt to supply their own needs, and in the East Japan and India are capturing much of the cheaper trade. Even the introduction of other textiles such as artificial silk at Preston, or of paper-making in the northern towns, has hardly relieved the serious position of Lancashire's main business.

But she has others. Though many people, from the makers of textile machinery to the Fleetwood fishermen, depend largely on the prosperity of the cotton trade, there are important industries less closely allied to it. Manchester manufactures electrical apparatus and motor lorries. Barrow-in-Furness, sheltered by Walney Island, builds ships with local iron, Liverpool and Birkenhead repair them. Lancashire, indeed, is one of the greatest workshops of the world.



Blast-Furnaces along the Limestone Ridge at Scunthorpe, Lincolnshire. Iron ore, coke and limestone are put in at the top. The molten iron sinks to the bottom of the furnace and is poured out, as here, into moulds to form pig or cast iron.

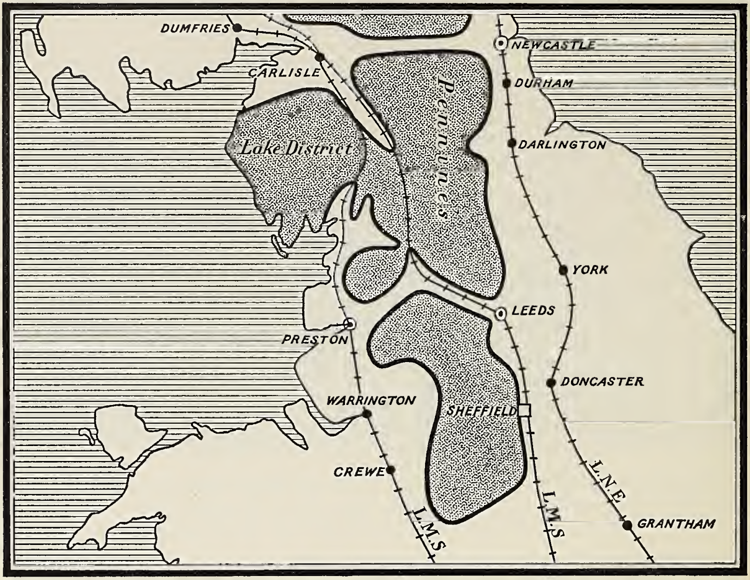
CHAPTER 28

NORTH-EAST ENGLAND

THE slope from the Pennines to the North Sea is interrupted in Yorkshire by the last of the ridges that bound the Inner Vale of Chapter 23. To the north lie the limestone Moors and their sheep-walks; to the south, the chalk Wolds produce excellent grain. Beyond these heights are many seaside resorts, of which Scarborough is the chief.

The long Vales of York and Trent are very fertile, though much is pasture land. York itself, on the (Yorkshire) Ouse, was once the Roman capital of the North and is now a picturesque cathedral city.

Far more coal is raised east of the Pennines than west of

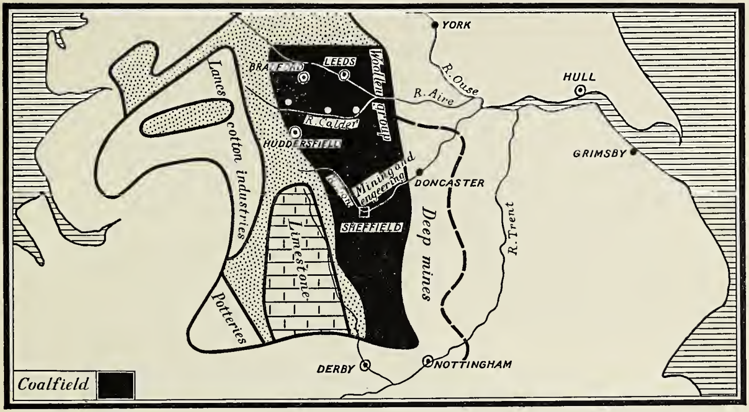

DUMFRIES
CARLISLE
NEWCASTLE
DURHAM
DARLINGTON
Lake District
Pennines
YORK
LEEDS
PRESTON
DONCASTER
WARRINGTON
SHEFFIELD
CREWE
L.M.S
L.M.S
L.N.E
GRANTHAM

Main railway routes to Scotland. See question 7, page 232.

them, which means that the eastern coalfields can sell a large amount elsewhere. On the eastern flanks of the South Pennine Moors the seams lie near the surface. This field extends sixty miles from Leeds south to Nottingham. The shafts are many, and the mining companies small. Further east the coal lies deeper—in places as much as half a mile down. Working is much more expensive, and some companies employ over 1,000 men. The centre of this area is Doncaster.

Though the mines are widely scattered, manufactures are gathered into three distinct groups—north, central and south. The first is the wool area of the Middle Aire and Calder Rivers region.

Fountains Abbey, Yorkshire.

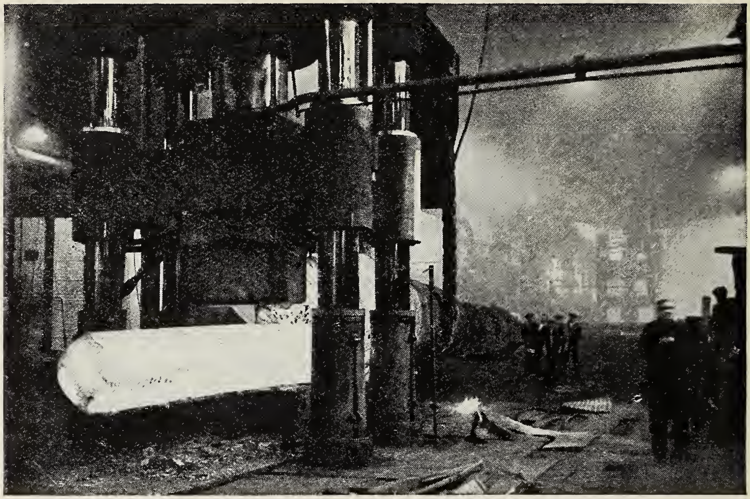

YORK
R. Ouse
HULL
R. Aire
GRIMSBY
BRADFORD
LEEDS
Woollen group
R. Calder
HUDDERSFIELD
Lancs cotton industries
Mining and engeering
DONCASTER
SHEFFIELD
Limestone
Deep mines
R. Trent
Potteries
DERBY
NOTTINGHAM
Coalfield

The Yorks-Notts-Derby Coalfield, on the east side of the Pennines. Deep mines are creeping eastwards towards the Trent. Notice (*a*) the three manufacturing areas, northern, central and southern; (*b*) the rivers of the woollen area of the north, which flow over the millstone gut (dotted).

We have seen that upland sheep produce short wool, and that the longer " staples " come from lowland breeds. But the longest and silkiest wool comes from the Australian merino. The longer, finer fibres are made into high-class " worsteds," in which you can see the threads; the shorter and coarser produce " woollens," such as blankets, in which the threads are beaten and pressed together. This is called " felting."

Pennine sheep and water-power and the soft water of the millstone grit explain the beginning of the woollen industry in the West Riding of Yorkshire. The lucky chance that coal was found, which is better than water-power, and the invention of machinery account for its rapid growth. When English wool ran short, the southern continents, and especially Australia, made up the supply.

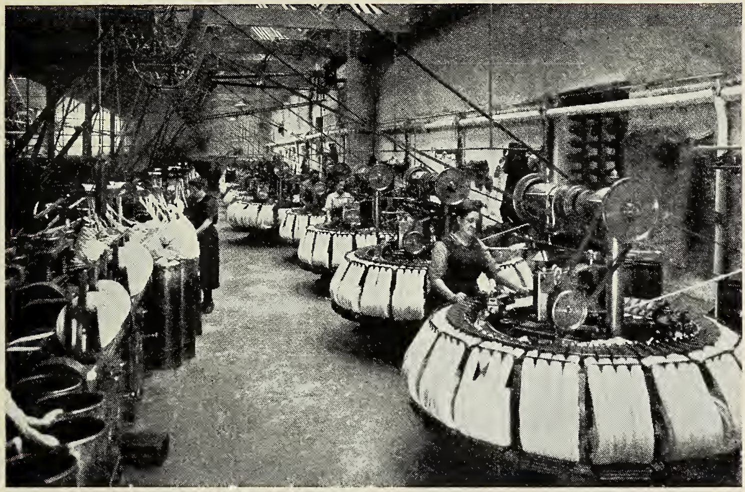
York Minster.



The Steel Industry. The pressing of a white-hot bar of steel into a ship's rudder-stock with a 3,000-ton press.

There is no separation of spinning and weaving into different districts as in the cotton trade. All stages from the raw wool to the finished product are completed in the same mills, but worsteds are mostly made in the north-west (though the finest cloths come from Huddersfield), and woollens in the south-east. Bradford is the Manchester of the wool trade. It deals alike in raw wool and cloth and makes and dyes both worsteds and woollens. Leeds is a tailoring town with printing and engineering works as well.

The second group consists of the steel towns of the Don Valley. For fine steel, Sheffield leads the world. Local iron ore and charcoal for its furnaces, abundant water-power and grindstones of the Pennine grit made Sheffield a cutlery town before the days of coal. Now the Don Valley makes heavier



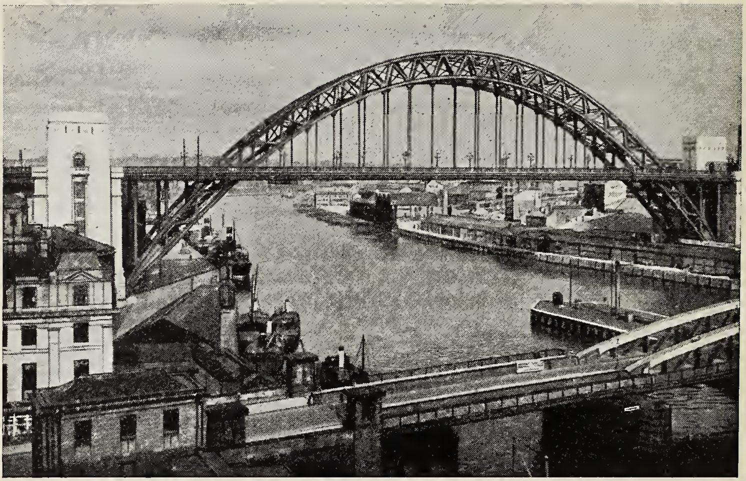
Wool-Combing. The machines on the right are combing out the short fibres. The wool left will be of the same length and so help to produce a yarn even in strength. The machines on the left straighten and combine the fibres from the combing machines and wind them into balls.

things as well—engines, rails, girders and armour-plating. The local iron is worked out, but " pigs " of Lincolnshire and foreign iron and large supplies of scrap-iron replace it, for old iron makes excellent steel.

Of the third group of towns, in the south, we said something on page 196. It combines the trades of the other two in the engineering of Derby and the hosiery of Nottingham.

The ports of the Humber are the sea-gates of the region. They face the North Sea fishing-grounds, the dairy and pig-farms of Denmark, the iron mines of Sweden and all the forests of North Europe. Fish, butter, bacon, iron,

Kirkstall Abbey, near Leeds.

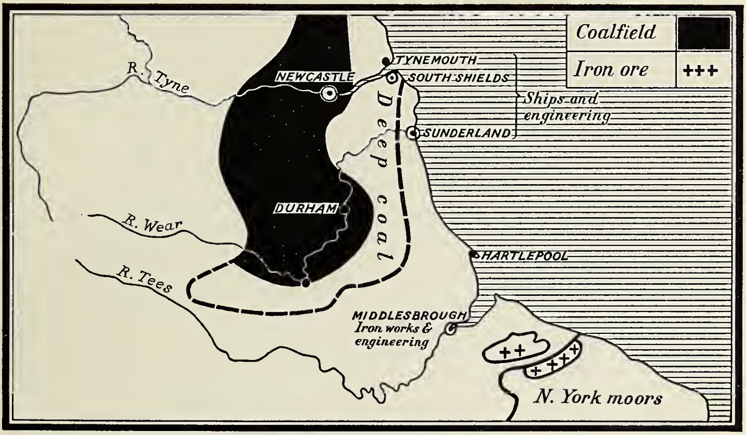


Newcastle and Bridge over the Tyne. At Newcastle the banks of the river are hard and close up, narrow enough for bridging. What in the photograph suggest that the banks here are high ? The old swing bridge is below. The river is lined with shipping and with engineering shops. Coaling platforms and shipbuilding yards are not visible; they are further downstream.

pitprops and planking are imported, as well as wool, wheat and oilseeds from more distant lands, to feed the hungry mouths and mills behind them.

Hull, like Liverpool, has mills for wheat, oilseeds and other bulky cargoes best dealt with at the port of entry. Its fishing fleet ranks next to that of Grimsby on this coast. Exports consist of coal, woollen goods and steel products of the neighbouring region and cotton goods from Lancashire.

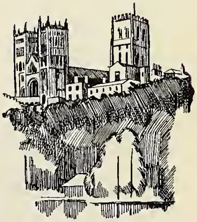
The northern coalfield of Northumberland and Durham extends as far south as the Tees. Here also the coal dips eastward to the sea, but the deep valleys of the Tyne and the Wear made it easy to work the seams near the coast, and


Coalfield
Iron ore +++
R. Tyne
NEWCASTLE
TYNEMOUTH
SOUTH SHIELDS
SUNDERLAND
Ships and engineering
Deep coal
DURHAM
R. Wear
R. Tees
HARTLEPOOL
MIDDLESBROUGH
Iron works & engineering
N. York moors

The Northumberland-Durham Coalfield. As in the Yorkshire coalfield, deep mines are creeping eastwards. This is an advantage where much coal is exported. The industries are based on coal and iron.

" sea-coal " was shipped to London even 500 years ago. Most of the coal today comes from deep mines east of a line through Newcastle and Durham. North of the Tyne a hard " steam " coal is found. The Durham pits produce softer varieties for household use and for making coke and gas. Much goes by coast-wise colliers to London, and much, in less difficult days, went to foreign ports.

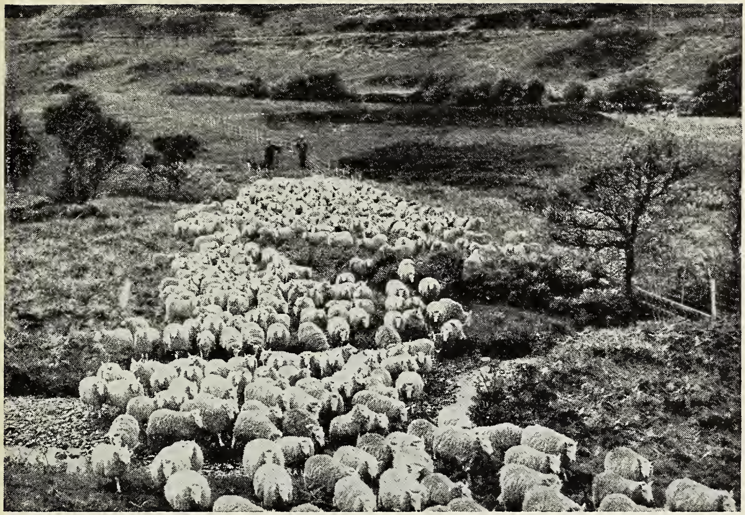
With this coal and local iron the region became a great engineering centre for railway and shipping material, but local iron has been replaced by pig-iron from Lincolnshire, Sweden, Spain and elsewhere. From Newcastle to Tynemouth, coal wharves, shipyards and engineering workshops line the banks of the deepened river. Sunderland and the two Hartlepools share the Tyneside industries and the North Sea fisheries.



Durham Cathedral.

The Tees came later into importance when the rich iron deposits of the North Yorkshire Moors were discovered. With their aid and the help of Durham coke, Middlesbrough, like Barrow-in-Furness, developed blast-furnaces, steelworks and shipyards, and trade flourished. The great bridge that spans Sydney Harbour in Australia was made there.

But both coal export and shipbuilding suffered very seriously in the recent failure of world trade, and this great industrial region, like that of South Wales, has known great hardships, from which it will take long to recover.



Cheviot Sheep. They are part of 10,000 which were being rounded up and driven down from the moors in July for clipping and marking. With narrow heads, clean faces and alert ears the Cheviot looks more intelligent than most sheep !

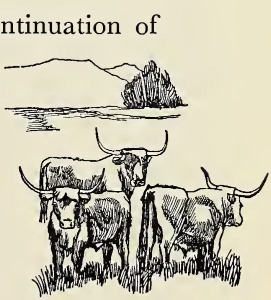
CHAPTER 29

SCOTTISH UPLANDS AND HIGHLANDS

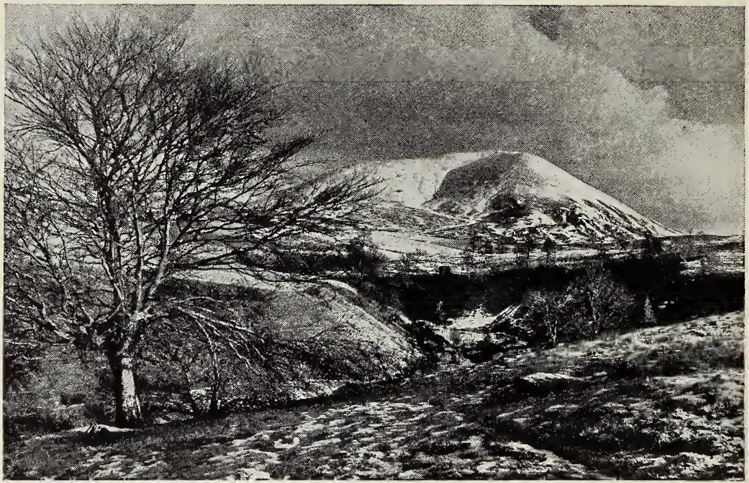
How lovely, Nith, thy fruitful vales,
  Where bounding hawthorns gaily bloom;
How sweetly spread thy sloping dales,
  Where lambkins wanton thro' the broom !

ROBERT BURNS.

THE southern Uplands of Scotland are a continuation of the Pennine Moorlands. The Cheviot Hills form the central boundary between England and Scotland, which continues westward over the Solway flats and eastward down the valley of the



HIGHLAND CATTLE.



In the Scottish Highlands. Glen and mountain. The view illustrates well the rounded outlines of the mountain due to the smoothing of the ancient ice sheet. The tree is a birch.

Tweed. At either end stand the border market-towns and railway junctions of Carlisle and Berwick-on-Tweed.

Steep slopes running from south-west to north-east divide the southern Uplands from the central Lowlands of Scotland. They start near Ayr and end beyond Dunbar. But though the northern edge is steep, the tops of the Uplands are worn into rounded summits rarely over 2,000 feet in height. They are covered with heather, grass and peat—a wild and lonely region—but their sheep-farms are the largest in the United Kingdom.

A full quarter of Great Britain is covered with rough mountain pasture. Above 1,000 feet the climate is rarely warm enough for ordinary crops,

Highland Piper.

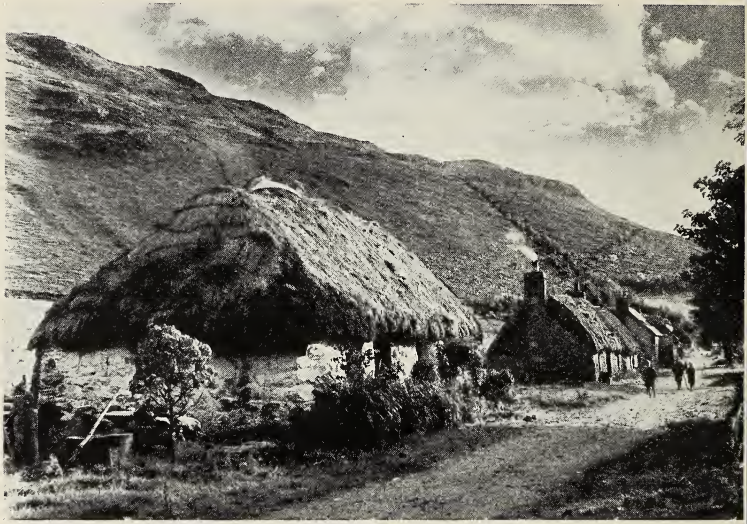
and the slopes are commonly too steep, the soil too thin or too wet for ploughing. Small and hardy breeds of cattle, such as the black Welsh or the West Highland, may be found there, or half-wild ponies, as on Dartmoor or Exmoor, but most of the cattle live in the dales and leave the moorlands to the sheep.

The commonest Scottish sheep is the black-face, a horned variety with long, coarse fleeces chiefly used for making rugs and carpets. The Cheviot breed is white-faced and hornless. It thrives best on the lower hills, and its finer wool was woven into the original Scottish "tweeds" till Australian wool replaced it. Local wool, rapid streams and soft water gave rise to a woollen industry at Galashiels and other places in the valleys of Upper Tweeddale. The sheep farmer's chief concern nowadays is to produce good mutton, for which the small mountain sheep are especially noted.

The Scottish shepherd has a hard and lonely life. He may have a flock of five or six hundred ewes and all their lambs to look after, and many miles of moorland to travel every day. His clever dogs save him much labour, but in winter both they and their master often risk their lives to save sheep buried deep in snow-drifts on the bleak and lonely moors.

On the west, rivers have cut valleys across the moors. They lead down to the cattle country of the Solway, where Dumfries is the largest market-town. One of the main railway lines follows the Nith Valley across the Upland barrier between Carlisle and Glasgow. The east coast expresses find a way close to the sea between Berwick and Edinburgh.

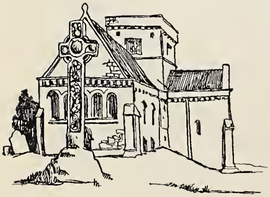
The Highlands cover more than half Scotland. Seen from the Lowlands, their southern boundary rises like a great wall, the "Highland Wall," from the Firth of Clyde nearly to Aberdeen. Both boundaries of the Lowlands, therefore, slant from south-west to north-east. The Highland rocks are the hardest in Britain, but wherever they were covered by the glaciers of the ancient ice they have been smoothed and rounded. The peaks that stood out above the ice are rough



A Crofter's Cottage, Isle of Skye, seems a primitive dwelling. The walls are of rough stone, whitewashed; the thatch of the roof is held down by ropes. Close to the cottage there is usually a potato patch and a small field of oats. Behind these the rough mountain pasture.

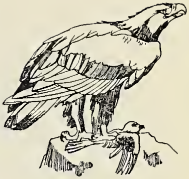
and jagged still. Most of the soil has been scoured into the valleys, and there the scattered farms are found.

The surface is a high, heathery plateau deeply carved by many streams and divided by the narrow trench of Glenmore (the "Great Glen"). The long lochs that fill it have been joined to form the Caledonian Canal. The south-eastern half consists mainly of the Grampian Mountains. Ben Nevis, 4,400 feet high, is the highest mountain in Britain (see picture, page 339), and several summits in the Cairngorms rise over 4,000 feet. The longer rivers, like the Spey, the Dee and the Tay, flow out to the

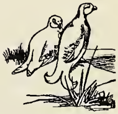


Iona Cathedral and Celtic Cross.

North Sea. Many of the glens contain long, narrow lakes, like Loch Lomond, often remarkable for their great depth and beauty.

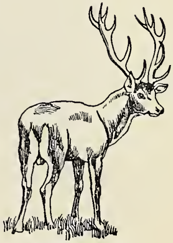

Golden Eagle.

The inner Highlands are the playground of the wealthy. Cattle may be found in the glens and sheep on the moors, but the higher ground is mostly deer "forest," though the red deer find few trees to shelter them from the weather or the stalker. The lower moors are the home of grouse and sheep; the lochs and rivers are famous for their trout and salmon. In such a country shepherds are rarer than "gillies," or keepers, and ploughmen rarer still. Many people in the remoter north-western districts still speak their native Gaelic, a language resembling Irish and, less closely, Welsh.

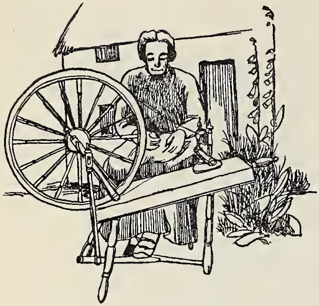

Capercailzie.

The west coast is a ragged pattern of sea-lochs, peninsulas and islands such as Skye and Mull, the relics of sunken river-mouths and ridges. Roads are long and rough, and many a village of the coast obtains its supplies by sea from Glasgow.

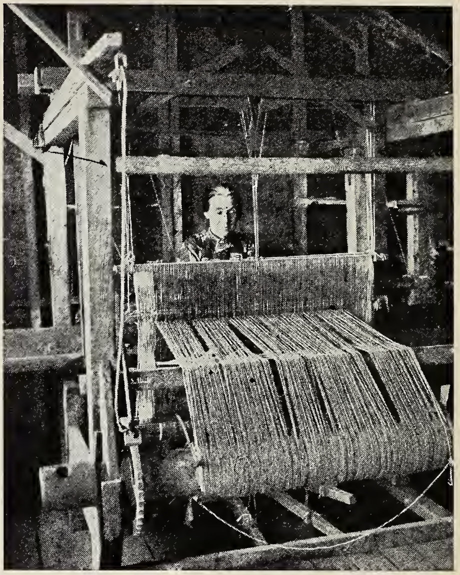
The east coast is very different. Clays and sands left behind by the glaciers cover a low coastal margin in the shelter of the mountains. It is a cattle country with much land under grass or roots and patches of good corn, and it faces the North Sea fishing-grounds. Here lie the only towns of any size. Aberdeen, a cattle-market and fishing-port, is by far the largest, with over 100,000 inhabitants. Inverness, at the head of the Moray Firth, is much smaller, but the junction of coast routes and inland valleys makes it the market and capital of the Highlands.


Red Deer.

Among the mountains water-power is plentiful, and electrical works are spreading rapidly (but not beautifully)—particularly round Glenmore. The



Spinning Wool.

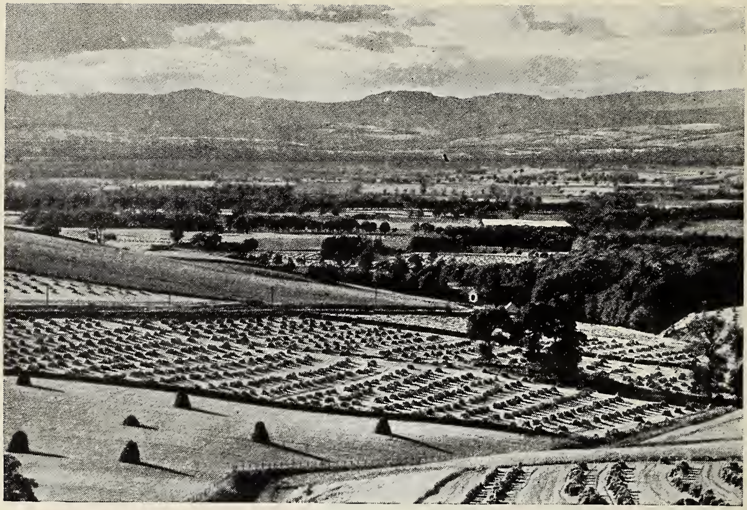


Hand-loom Weaving, Isle of Skye. The woman is making "Harris" tweed with the rough coarse threads. But the cloth is splendidly warm and wears well. It smells of the peat fire which warms the room.

power station at Fort William draws water through a fifteen-mile tunnel under Ben Nevis.

Beyond the Minch and Pentland Firth, the Outer Hebrides and the Orkney and Shetland Islands form the furthest outposts of Great Britain. The crofters of these islands are fishermen-farmers who grow a little oats and potatoes on their scanty fields. The little ponies and long-woolled sheep of the Shetlands are well known; but all the islands breed sheep, and the crofters make their own clothes from the wool. Harris tweeds and Shetland shawls find a ready market on the mainland. It is satisfactory to know that no machinery has yet been invented which can replace the skilful handwork of these islanders.

Glamis Castle.



Strathmore. Nearly all the vale floor is under cultivation. The edge of the Highlands, which is seen in the background, shelters it from cold northerly winds.

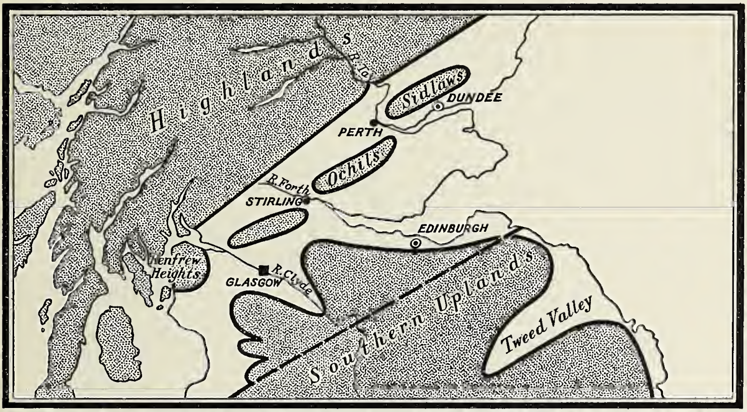
CHAPTER 30

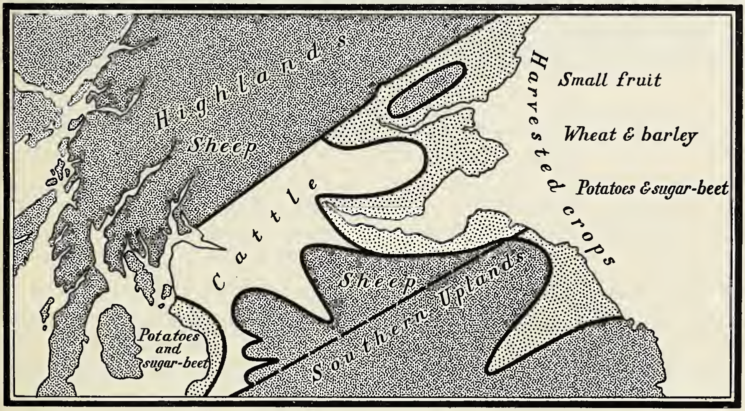
THE SCOTTISH LOWLANDS

NOW we must come back to the central Lowlands. Three-quarters of the population of Scotland live there, for the soils are varied, the climate mild, and there are wide coalfields close to long inlets of the sea.

The Lowlands are not all flat. In front of the " Highland Wall " there is a belt of lower hills ending in the Sidlaws. Between the Sidlaws and the Highlands lies Strathmore (the " Great Vale "), a fine farming region. There is another more broken belt of hills in front of the southern Uplands, and the Pentlands south of Edinburgh belong to it.

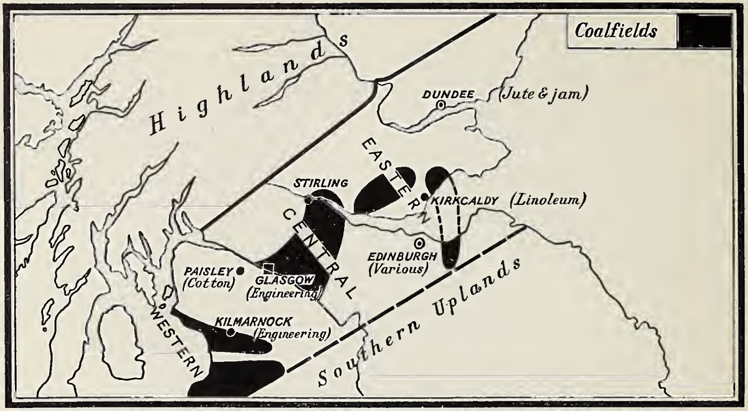
Because of their softer rocks and mixed soils the Lowland


Highlands
R. Tay
Sidlaws
DUNDEE
PERTH
Ochils
R. Forth
STIRLING
EDINBURGH
Renfrew Heights
GLASGOW
R. Clyde
Southern Uplands
Tweed Valley


Highlands
Sheep
Cattle
Harvested crops
Small fruit
Wheat & barley
Potatoes & sugar-beet
Sheep
Southern Uplands
Potatoes and sugar-beet

Central Lowlands (1): Surface Features. High land is dotted. Note the positions of Perth and Stirling at gaps through a belt of hills.

Central Lowlands (2) : The Use of the Land. The chief regions of cultivation are dotted.


Coalfields ■
Highlands
DUNDEE (Jute & jam)
EASTERN
STIRLING
KIRKCALDY (Linoleum)
CENTRAL
EDINBURGH (Various)
PAISLEY (Cotton)
GLASGOW (Engineering)
KILMARNOCK (Engineering)
WESTERN
Southern Uplands

Central Lowlands (3): Coalfields and Industries. The three chief coalfields are shown. Industries in the western and central are chiefly concerned with engineering, in the eastern with coarse textiles, especially jute products.

valleys are fertile. The west, being rainier, is mainly cattle pasture, but along the Ayrshire coast potatoes and sugar-beet are grown. Inland and in the valley of the Clyde, we find the dairy-farms and market-gardens which supply the Glasgow industrial region with milk and fruit and vegetables.

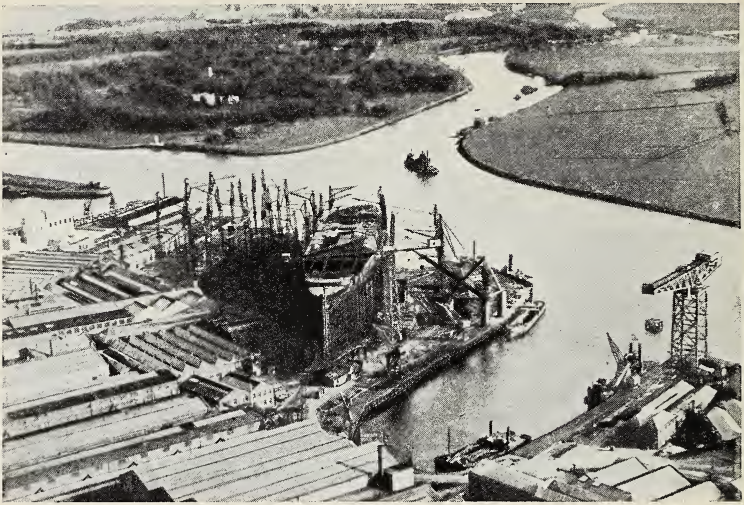
In the sunnier east most of the grain is found. Oats, indeed, grow nearly everywhere, but round the Firths of Tay and Forth the farmers produce excellent wheat and barley as well as potatoes and sugar-beet. Soft fruit is also grown in sheltered regions. Raspberry fields cover part of Strathmore, and the fruit of the Carse (or " Plain ") of Gowrie, just east of the Sidlaws, is used by the jam-makers of Dundee.

There are three coalfields across the Lowlands, and iron-mines too, though the iron is scarcer than it was. The western coalfield is in Ayrshire. Its mines are scattered and do not

The Ayrshire is brown and white with rather large upward-curving horns. It is a hardy animal and does well on poor pastures and in cold districts.

therefore spoil the whole landscape. Some coal is shipped to Ireland, but much is used for local engineering, as in the railway-works around Kilmarnock.

The central coalfield lies chiefly in Lanarkshire along the Lower Clyde. Two hundred years ago the Clyde could be forded at low tide a dozen miles below Glasgow. The river was first deepened because tobacco-merchants wanted their American cargoes unloaded in the town. Now the largest vessels can use the river, and many are built in the shipyards which line the Lower Clyde for twenty miles. Above Glasgow the chief of many trades is engineering. At first marine-engines were made for the shipbuilding, then railway and other engines, steam-pumps, stoves and boilers. The Forth, Tay and



Shipyard on the Clyde. A large vessel is on the slip-way, which is placed opposite the mouth of a tributary to give extra space for launching. Close at hand are boiler, engine and other shops.

Tower Bridges all came from this district, and in making machine-tools it rivals South Lancashire. The engineering industry employs nearly 100,000 men, and Glasgow, with over a million inhabitants, is the second city of the Kingdom.

The early trade with America might have created a great cotton industry here as in Lancashire, but engineering has gone ahead more rapidly. Paisley, however, makes countless miles of cotton thread.

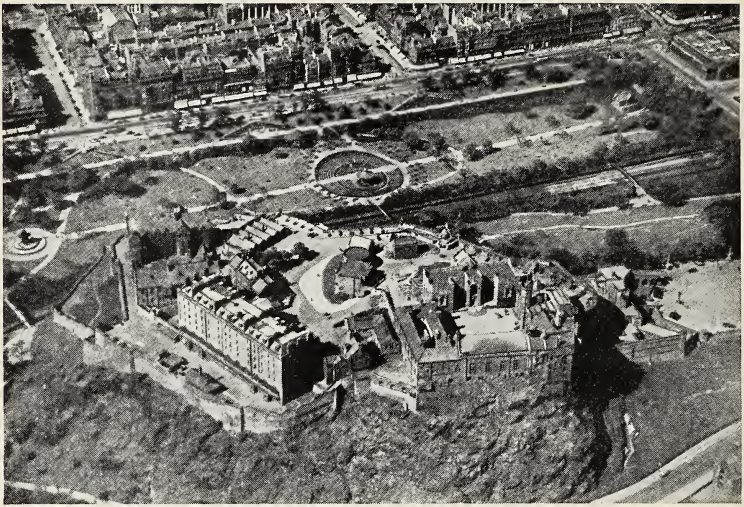
The eastern coalfield runs under the Firth of Forth from Fifeshire to Midlothian. More than half the coal is exported, and the industrial towns are more scattered than in the west. Except Edinburgh they are mainly engaged in weaving the

The Forth Bridge is one of the finest bridges in the world. It carries the railway from Edinburgh to Aberdeen across the Firth of Forth. It is nearly two miles long and is 150 feet above the water.

coarser textiles. Dundee makes Indian jute into " hessian " canvas for sacking, and Kirkcaldy uses the " hessian " as a backing for the solidified oil and other materials in its great linoleum industry.

The level plains of the Lowlands make traffic easy by road, rail or canal, and the valleys of the Clyde, Forth and Tay bring ships far inland. Raw materials, pit-props and foodstuffs from abroad are brought by these ships, and the finished products of the various industries taken away.

Edinburgh is sometimes called the " Athens of the North " because it is so fine a city. " Auld Reekie " is its more affectionate name when the smoke of the Old Town rises to the newer streets and houses above it. As the capital of Scotland, the headquarters of lawyers and bankers and a university city, Edinburgh has a large professional population. But nearly half its workers are engaged in manufactures. Paper-makers and printers supply the needs of the Government, the law



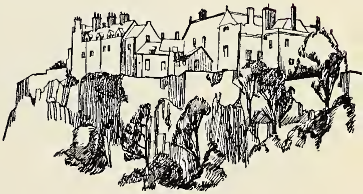
Edinburgh. The castle is in the foreground, high on its steep-sided lump of lava. On the far side, at the foot of the rock, public gardens have been made out of what was once a marsh. In the background is Edinburgh's famous Princes Street.

courts, the university and the business houses. Whiskey is distilled from the barley of the neighbourhood, and wheat and timber landed at Leith give employment to millers and woodworkers. But the population is only half that of Glasgow.

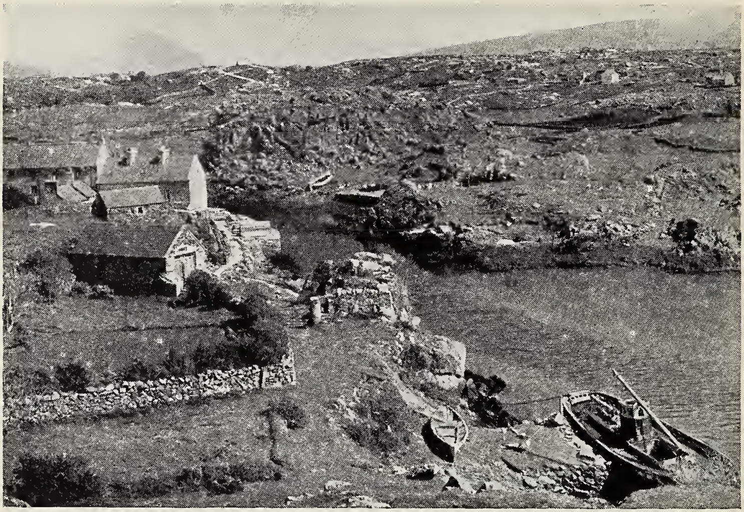
Edinburgh lies where the coast road from England is shut in between the Pentlands and the Firth of Forth. Just here a high dark crag of lava, which had cooled in the throat of an old volcano, made a wonderful watch tower and an easily defended site for a castle. Round this stronghold the city grew, but it was not at first the Scottish capital.

In earlier days the Lowlanders' enemies were not the English but the raiding Highland clans. The main route from the central Highlands led down the Tay Valley through the gap west of the Sidlaws. The Highland Railway follows the same route today. There at the head of the estuary, where the first bridge crossed the river, the town of Perth kept watch upon the raiders. So Perth became the stronghold and capital of the Scottish Kings, but nowadays it is chiefly known for its dye-works.

Stirling is another " gap-town," lying at the point where the River Forth cuts through the same line of hills. The gap was defended by a castle built on a volcanic crag like that of Edinburgh. Stirling is now a centre of the woollen industry. Like many other gap-towns, Perth and Stirling have become modern railway junctions.



THE ROCK AND CASTLE
AT STIRLING.

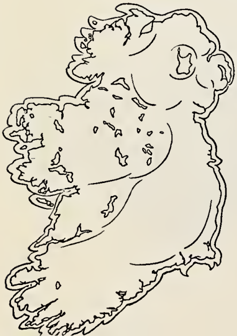


Rock and Mountain and Sea in Donegal. The land is rocky. Small patches of soil, enclosed by stone walls, lie in hollows of the granite. These may grow a few oats and potatoes or feed a cow or a donkey. But in this remote region a family must supply most of its needs and turns to the sea as well as the land. The many rocky coves shelter fishing boats.

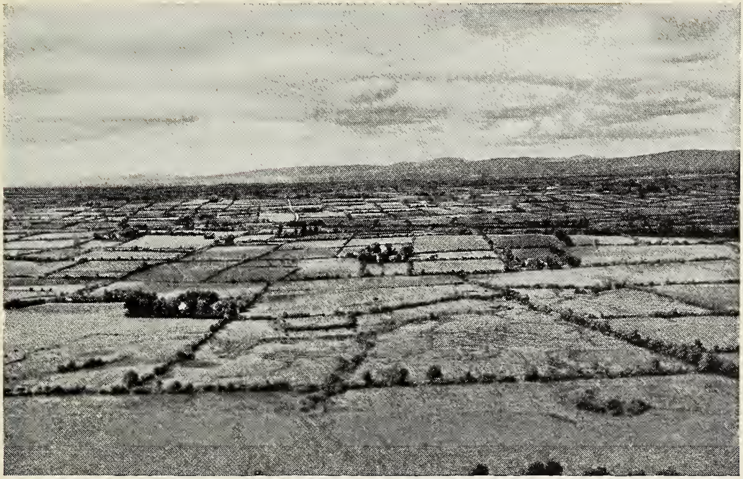
CHAPTER 31

IRELAND

IF we look at a good physical map of Ireland, we can see something like a cockatoo facing Great Britain across the Irish Sea. Its eye is large and watery; its Roman beak appears to threaten the Isle of Man, and a toe appears below Rosslare; but its crest is crushed, its flapping wings are clipped, and it has lost its best tail-feathers. It seems to have suffered from the storms of the wild Atlantic, on which it turns its back.



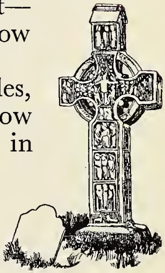
In this last point, indeed, the idea is not entirely fanciful. The west coast, like that of Great



The Golden Vale of Tipperary. The Vale is a chess-board of small grass fields enclosed by hedgerows. White farm-houses are sheltered by clumps of trees. This landscape should be contrasted with the scene in Donegal.

Britain, shows many marks of the violence of the ocean waves in islands and inlets and broken cliffs. But the most striking thing about Ireland is its great Central Plain. From north to south it is fifty miles across, and three times as much from east to west. The land is too low and flat for rapid drainage. It is a land of shallow lakes and peat-bogs, such as the great Bog of Allen, with dry limestone patches standing out of the bogland here and there. These heights lie chiefly in the west—rocky masses on which scarcely anything will grow at all.

Across the centre the longest river in the British Isles, the Shannon, wanders slowly to the Atlantic. But below Lough Derg the current quickens to drop 100 feet in



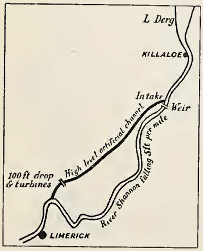
Ancient Irish Cross.

20 miles. Here the water has been turned into a new channel, which keeps it at a high level to a point above Limerick. Then it falls suddenly to the river level, turning as it falls the turbines of a great power station, which is to supply electricity to a great part of Southern Ireland.

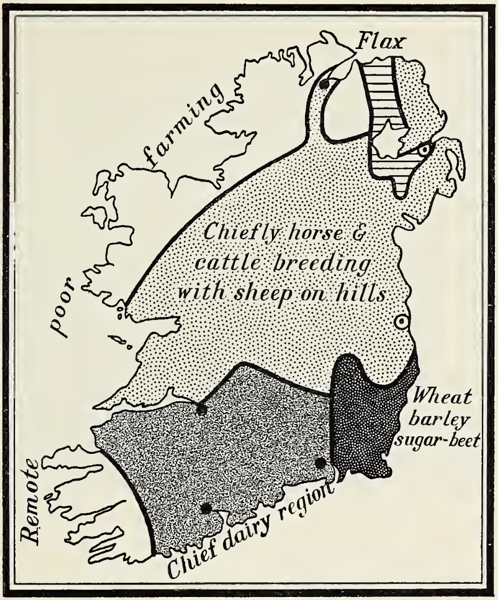
The Central Plain is a cattle country, though oats and potatoes, as everywhere in Ireland, are grown for food. Farms are scattered, villages and market-towns are small and widely spaced. The broad and marshy Shannon, which widens into the shallow Loughs Ree and Derg, has few crossing-places. The chief is Athlone, a road and railway junction and the central broadcasting station for Southern Ireland.

A broken rim of highlands with openings leading to the sea surrounds the Central Plain. On the north-west a few ancient ports, such as Galway, face the wide Atlantic with a poor country, for the most part, of rock and bog and mountain behind them. They have little to offer that is worth the long sea-journey. Limerick, on the Lower Shannon, is more fortunate. It has the dairy farms of the Golden Vale south-east of it and its bridges are the last on the river. So the railways cross here, and Limerick has an important market and large bacon factories. The Shannon electricity works are close beside it, and Foynes, the Irish base of the Newfoundland air-route, lies a few miles down the estuary.

To reach the south coast from the centre is less easy. Instead of separate mountain masses, barrier ridges run east and west, though the valleys between them are broad and fertile. At their western end these valleys sink into a series of inlets between long peninsulas, the tail-feathers of our cockatoo. The "soft" Irish climate, which makes the "Emerald Isle" so green, is here at its mildest and wettest. The mountain scenery attracts many tourists (though they need their mackintoshes !). The lakes and romantic ruins of Killarney nestle under Ireland's highest mountains, Macgillicuddy's


L Derg
KILLALOE
Intake
Weir
High level artificial channel
River Shannon falling 5ft per mile
100 ft drop & turbines
LIMERICK

The Shannon Power Scheme.

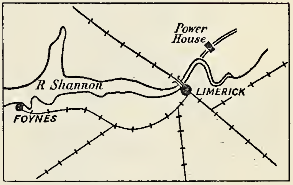

The Distribution of the Chief Occupations in Ireland.

Flax
farming
poor
Remote
Chiefly horse & cattle breeding with sheep on hills
Wheat barley sugar-beet
Chief dairy region

Reeks.* They form the most celebrated of Ireland's many beauties.

Eastwards, however, these valleys end in sheltered harbours opening towards England. This is the great dairying region of Ireland. Cork and Waterford export butter, eggs and bacon, the first from the valley of the Lee, the second from that of the Suir and rivers flowing from the north.

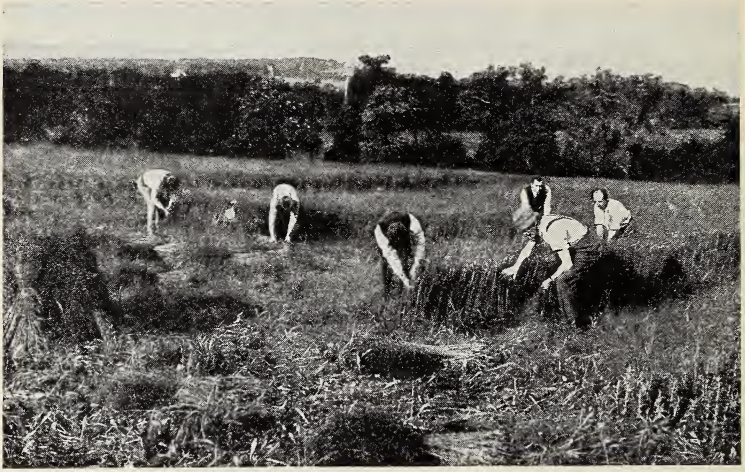
On the east coast, between the Mourne Mountains and the Wicklow Hills, the Central Plain opens straight on the Irish Sea. Near the south end of this fifty-mile gap stands Dublin, with its harbour, on the Liffey. It ships the cattle of the Plain to be fattened in England, and the ale, stout and whisky of its own breweries and distilleries. All Ireland's roads, railways and canals were built to lead to Dublin, the ancient capital of Ireland


THE POSITION OF LIMERICK.

Power House
R Shannon
LIMERICK
FOYNES

---

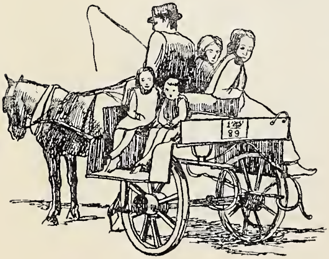
* I.e., *Ricks*, for the peaks from a distance look like the pointed tops of Irish hay-ricks.



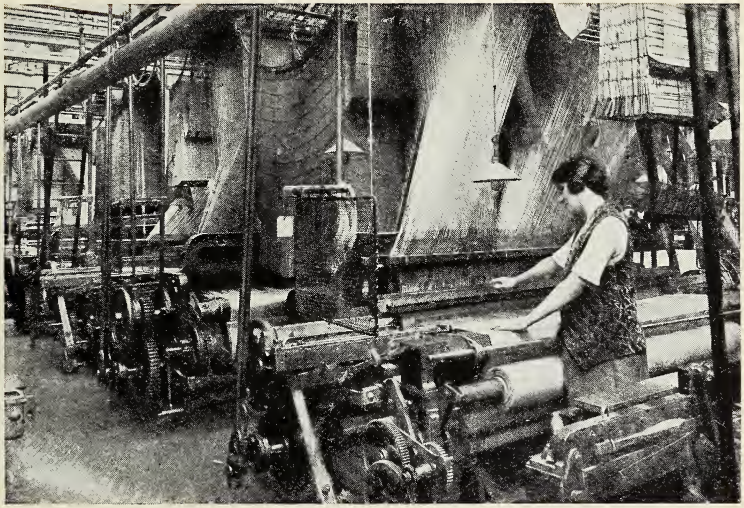
Linen Industry (1): The flax plant, 2 or 3 feet high, is pulled by hand in August; thus the ragged ends make spinning into yarn easier. After soaking in water for 10 days or so the outer fibre is loosened (rotted or retted) and then revolving blades in the factory separate it from the woody stem.

and now of Eire, the Irish Free State. It is a pleasant city with some fine buildings. Its population is nearly half a million.

Beyond the Mourne Mountains lies Belfast, the capital of Northern Ireland. Its population is slightly smaller than that of Dublin, but it is the centre of the most important industrial region of the whole island. The linen industry is partly supplied from the flax-fields of the neighbouring lowlands; the shipbuilding yards on Belfast Lough must take their coal and steel from Scotland, for there is none to be had in Ireland. Of the $1\frac{1}{4}$ million inhabitants of Northern Ireland more than one-third live in Belfast, and the remainder



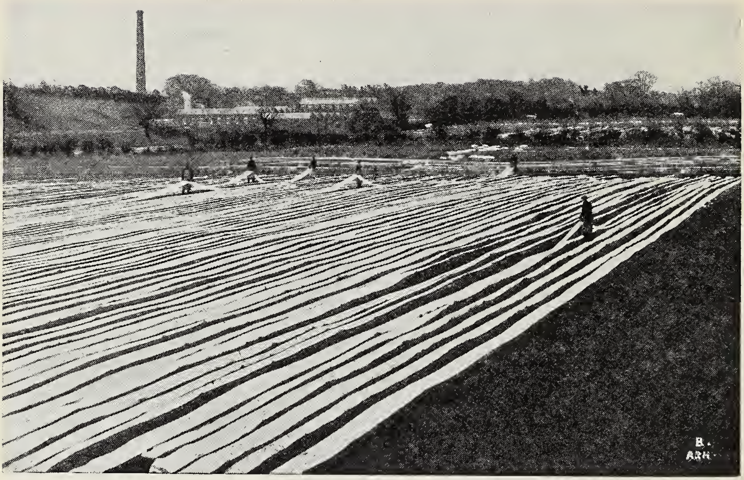
An Outside Car.



Linen Industry (2): The many threads are being woven into high-class cloth. With its long straight fibres linen does not expand and shrink like the short twisted cotton, and it is much stronger. Hence it is used for the wings of aeroplanes. The surface of linen is smooth and does not get dirty so quickly as cotton, so that linen tablecloths, sheets, collars and the like are in demand.

look to it as their chief market. Londonderry, the next largest town, is only a tenth of its size. The most fertile region is the valley of the Bann, which drains Lough Neagh, the largest lake in the British Isles.

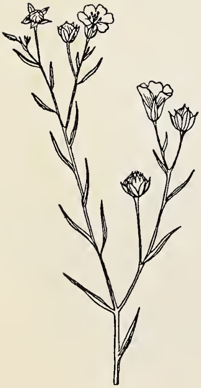
The population of Northern Ireland is largely descended from English and Scottish settlers planted there by James I. These people were not only keener business men than most Irishmen, they were also Protestants, whereas the Irish in general are strong Roman Catholics. The two populations found it hard to agree. When the question of Irish independence came to be settled after the War, Belfast, the richest and



Linen Industry (3): The natural colour of linen cloth, as it comes off the looms, is brown. To whiten or bleach it the strips are treated with chemicals and then alternately boiled and laid out on " bleach fields " in the open air.

most active town in Ireland, and the six counties behind it refused to separate from the United Kingdom. Ireland is therefore two countries with a frontier between them as complete as that which separates Canada from the United States, though Eire remains a part of the British Empire.

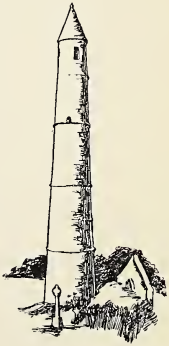
Eire has just under 3 million inhabitants, which makes less than $4\frac{1}{4}$ millions for the whole island. A hundred years ago there were 8 millions. But famines caused by the failure of the potato crop, the main food of the people, and emigration to America have steadily reduced the population. Yet even now it seems to be larger than the country can support.



Flax Flower.

The fault lies mainly with the soil, but the farms, which usually belong to the farmers, are often too small to support a family. Wise and generous efforts have been made to improve things. Nevertheless, in many parts the people depend largely on money sent from America by their relatives. New York, it is said, is the real capital of Western Ireland. In summer one sees few young men or women there, for once the peat is cut and stacked there is little to do. Many are forced to cross the Irish Sea to find work, which they would rather find at home.

> " Over here in England I'm helpin' wi' the hay,
> An' I wisht I was in Ireland the livelong day;
> Weary on the English hay, and sorra take the wheat !
> *Och ! Corrymeela an' the blue sky over it !*"
>
> EVA GORE BOOTH.



ANCIENT ROUND TOWER AT GLENDALOUGH.

CONCLUSION

OUR second journey round the world is ended. We have seen something of every part of it, though time has not allowed us to see much. But we ought now to have some idea of the way men live in other lands and in other parts of our own. Perhaps we can even understand some of the difficulties that face both them and us.

There is only one globe for all men to inhabit, and no nation can afford to live unmindful of the rest. Foreign countries already influence our daily lives; they will concern us more nearly every year we live. By land and sea and air the peoples of the world are drawing closer: at least we need not meet them as utter strangers.

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